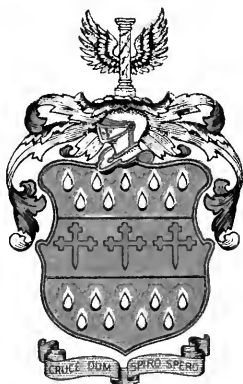


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VIRGINIA: *Board of Immigration*

A

GEOGRAPHICAL AND POLITICAL SUMMARY,

EMBRACING

A DESCRIPTION OF THE STATE, ITS GEOLOGY, SOILS, MINERALS
AND CLIMATE; ITS ANIMAL AND VEGETABLE PRODUCTIONS; —
MANUFACTURING AND COMMERCIAL FACILITIES;
RELIGIOUS AND EDUCATIONAL ADVANTAGES;
INTERNAL IMPROVEMENTS, AND FORM
OF GOVERNMENT.

Comp. by Jediaiah Hotchkiss

PREPARED AND PUBLISHED

UNDER THE SUPERVISION OF THE BOARD OF IMMIGRATION,
AND BY AUTHORITY OF LAW.



RICHMOND, VIRGINIA:
R. F. WALKER, SUPERINTENDENT OF PUBLIC PRINTING.
1876.

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PREFATORY.

The change in the labor system and the loss of capital in Virginia, resulting from the late war, having thrown large bodies of land out of cultivation and suspended or crippled many industrial enterprises and occupations, the General Assembly of the State, responding to the wishes of the people, have adopted various measures to promote immigration and induce the introduction and investment of means. As early as March, 1867, resolutions were adopted by that body inviting "all classes of men, from all countries, to Virginia, to settle the surplus lands and engage in all the great industrial pursuits."

At a later day the same body passed an act creating a Board of Immigration, and reciting in the preamble to the act that "in order to the restoration and improvement of our agriculture, the development of our numerous mineral resources, the introduction and support of manufacturing industry, and the fixed and permanent establishment of a population corresponding with the capacity of our vast and sparsely settled territory, it is eminently expedient to invite the migratory population of other States, both American and European, to fix their homes and invest their capital among us;" and to this end, they instructed the Board of Immigration to have prepared "a geographical and political summary, setting forth the numerous advantages of climate, soil and productions which are here offered to foreigners seeking settlement in new countries."

The Board of Immigration so created was composed of the Governor, the Lieutenant-Governor, the Secretary of the Commonwealth, the Adjutant-General and the Treasurer of the State. In the execution of the duty devolved upon them, they selected for the preparation of the summary Major JED. HOTCHKISS, of Staunton. They were led to select this gentleman, as they stated in their report to the Legislature, "because, in the pursuit of his calling as a topographical and mining engineer, he had devoted much time to acquiring accurate knowledge of the geography, the varied physical elements; the internal improvements and capabilities, the agricultural, manufacturing and general industrial condition and resources of the State, and was believed to possess greater experience and aptitude for the work than any person known to the Board."

The work in its successive stages was submitted to the Board, and underwent their careful supervision and criticism. When it was completed they gave it their endorsement in the following language, embraced in their report to the Legislature: "The Board feel warranted in saying that the work will prove itself, upon examination, to be of the very highest value and interest to the State; that it embodies and exhibits in accurate, lucid and comprehensive form complete information upon all the important topics treated; and that it constitutes a repository of most valuable information not to be found in any existing publication. The statistical tables comprise the results of laborious research through many scattered sources of information, and exhibit facts as to the actual production and the varied industrial capabilities of the State, which are instructive and gratifying. Maps accompany the work, prepared specially for its illustration; and the section which treats of the geological and mineral characteristics of each grand division presents, in a carefully condensed form, the results of the geological survey made by Professor WM. B. ROGERS, with the additional information obtained by Major HOTCHKISS, through his investigation in the same field."

This work is now submitted to the public in the following pages.

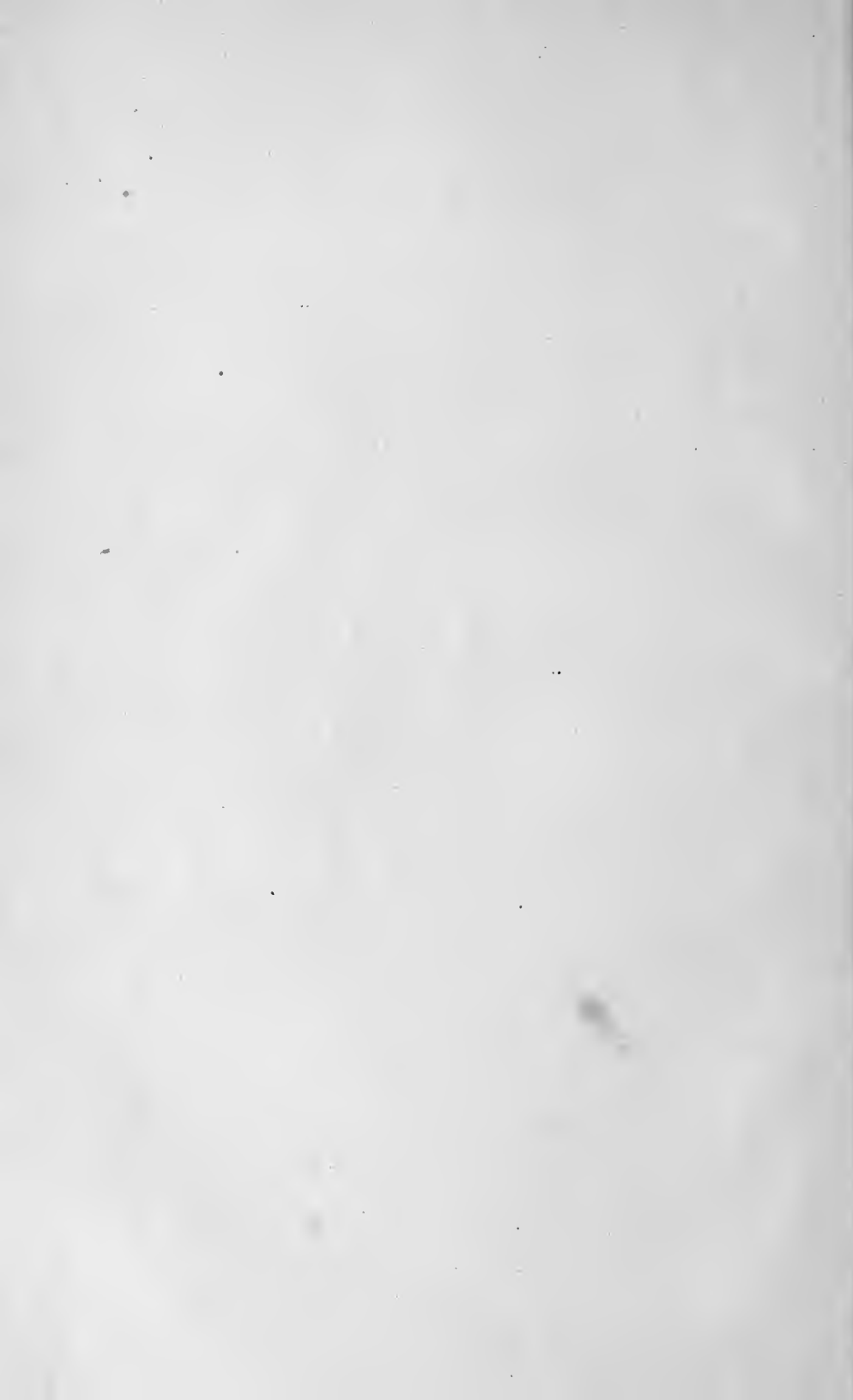
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VIRGINIA.

PART I—GEOGRAPHICAL SUMMARY.

CHAPTER I—GENERAL DESCRIPTION OF THE STATE.

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VIRGINIA.

PART I—GEOGRAPHICAL SUMMARY.

CHAPTER I.

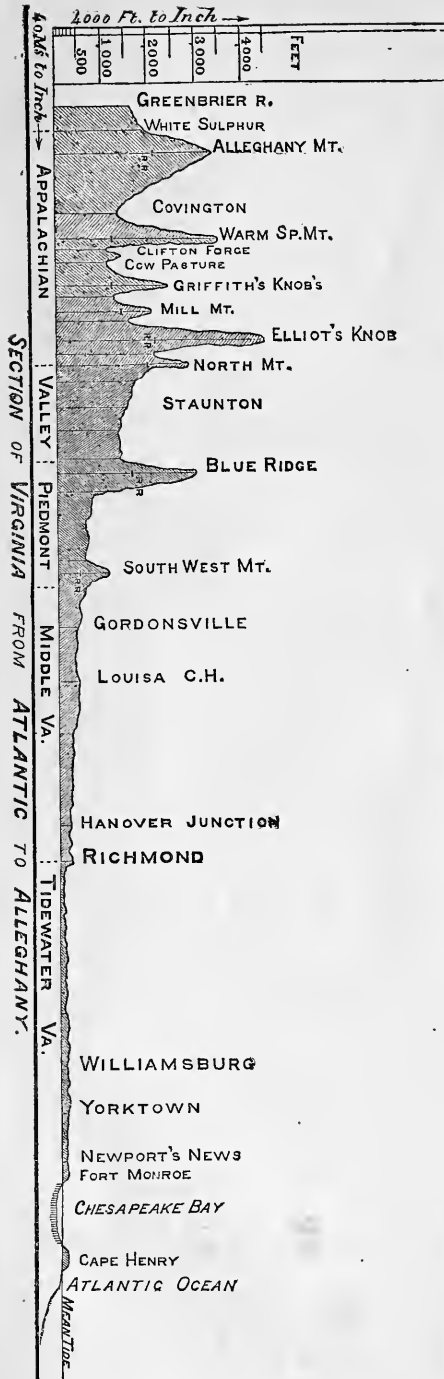
A GENERAL DESCRIPTION OF THE STATE.

LOCATION.—Virginia is one of the Middle Atlantic States* of the United States of America, lying midway between Maine on the north and Florida on the south. It is also in the belt of Central States, across the continent from east to west. Its latitude is from $36^{\circ} 31'$ to $39^{\circ} 27' N.$, corresponding to Southern Europe, Central Asia, Southern Japan, and California. Its longitude is from $75^{\circ} 13'$ to $83^{\circ} 37'$ west from Greenwich. It extends $2^{\circ} 57'$ north and south, and $9^{\circ} 24'$ east and west.

BOUNDARIES.—On the south it adjoins North Carolina for 326 miles, and Tennessee for 114 miles, making the line of the State from the Atlantic west 440 miles; on the west and northwest, Kentucky for 115 and West Virginia (by a very irregular line) for 450 miles, form the boundary. Maryland is northeast and north, separated by the Potomac and Chesapeake bay for 205 miles from Virginia (to which these waters belong), and by a line of 25 miles across the Eastern Shore. East and southeast it is bordered by the Atlantic for 125 miles. The boundary lines of the State measure about 1,400 miles: on the northwest they are mostly mountain ranges; on the northeast and east, water.

DIMENSIONS.—The longest line in the State, from the Atlantic southwest to Kentucky, is 476 miles; the longest from N. to S. is 192 miles. The longest line in England (N. E. to S. W.) is 372 miles, and the longest from N. to S. is 360 miles.

* Guyot classes New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia and West Virginia as Middle Atlantic States. Maury follows the same classification.



NATURAL DIVISIONS.—There are six great Natural Divisions of the territory of Virginia; belts of country extending across the State from northeast to southwest, as a general direction, nearly parallel to each other, and corresponding to the trend of the Atlantic coast on the east, and of the ranges of the Appalachian system of mountains on the northwest.

These Grand Divisions are, taken in the order of succession from the ocean northwest across the State:

1st. The **TIDEWATER** Country, or **TIDEWATER**.

2nd. The **MIDDLE** Country, or **MIDDLE VIRGINIA**.

3rd. The **PIEDMONT** Country, or **PIEDMONT**.

4th. The **BLUE RIDGE** Country, or **THE BLUE RIDGE**.

5th. The **GREAT VALLEY OF VIRGINIA**, or **THE VALLEY**.

6th. The **APPALACHIAN** Country, or **APPALACHIA**.

These Divisions not only succeed each other geographically, as shown upon the map, but they occupy different levels above the sea, *rising to the west* like a grand stair-way, as shown by the section.* They differ geologically also; therefore they have differences of climate, soil, productions, &c., and require a separate consideration, in every respect, in a description of the State.

* Copied by permission from Scribner's Magazine—article on Virginia by Jed. Hotchkiss, December, 1872.

GROUPING OF COUNTIES IN NATURAL GRAND DIVISIONS OF VIRGINIA.

GRAND DIVISIONS OF STATE.		NATURAL SUB-DIVISIONS.	COUNTIES.	
(1). TIDEWATER	The <i>first peninsula</i> , or "THE NORTHERN NECK."		King George. Westmoreland. Richmond. Northumberland. Lancaster	
	The <i>second</i> , or MIDDLESEX PENINSULA,		Essex. Middlesex.	
	The <i>third</i> , or GLOUCESTER PENINSULA..		King & Queen. Mathews. Gloucester.	
	The <i>fourth</i> —the KING WILLIAM or PAMUNKEY PENINSULA		Caroline. King William.	
	The <i>fifth</i> , or "THE PENINSULA".....		Hanover. New Kent. James City. York. Warwick. Elizabeth City.	
	The <i>sixth</i> —RICHMOND or CHICKAHOMINY PENINSULA.....		Henrico. Charles City. Prince George. Surry. Sussex.	
	The <i>seventh</i> , or SOUTHSIDE PENINSULA,		Southampton. Isle of Wight. Nansemond.	
	The <i>eighth</i> , or NORFOLK PENINSULA.....		Norfolk. Princess Anne.	
	The <i>ninth peninsula</i> —"THE EASTERN SHORE"		Accomac. Northampton.	
	2). THE MIDDLE COUNTRY.	NORTHSIDE GROUP.	POTOMAC BASIN	Fairfax. Alexandria. Prince William. Stafford.
PAMUNKEY BASIN.....			Spotsylvania. Louisa.	
JAMES BASIN.....			Fluvanna. Goochland. Buckingham. Cumberland. Powhatan. Chesterfield. Appomattox.	
SOUTHSIDE GROUP.		JAMES-APPO-MATTOX BASIN.	Prince Edward. Amelia.	
		NOTTOWAY BASIN.....	Dinwiddie. Nottoway.	
		MEHERRIN BASIN.....	Lunenburg. Brunswick. Greensville.	
		ROANOKE BASIN	Campbell. Charlotte. Pittsylvania. Halifax. Mecklenburg.	
		POTOMAC WATERS.....	Loudoun. Fauquier. Culpeper.	
(3). THE PIEDMONT COUNTRY.....		RAPPAHANNOCK WATERS.....		Rappahannock. Madison. Greene. Orange.
		JAMES WATERS.....		Albemarle. Nelson. Amherst.
	STAUNTON WATERS.....		Bedford. Franklin.	
	DAN WATERS.....		Henry. Patrick.	

GRAND DIVISIONS OF STATE.	NATURAL SUB-DIVISIONS.	COUNTIES.
(4). THE BLUE RIDGE.....	NEW RIVER PLATEAU.....	Floyd. Carroll. Grayson. Frederick. Clarke. Warren.
	THE SHENANDOAH VALLEY.....	Shenandoah. Page. Rockingham. Augusta.
(5). THE VALLEY OF VIRGINIA	THE JAMES RIVER VALLEY.....	Rockbridge. Botetourt.
	THE ROANOKE VALLEY.....	Roanoke.
	THE NEW RIVER OR KANAWHA VALLEY.....	Montgomery. Pulaski. Wythe.
	THE HOLSTON OR TENNESSEE VALLEY.	Smyth. Washington.
	SOURCES OF JAMES.....	Highland. Bath. Alleghany. Craig.
(6). APPALACHIA.....	NEW RIVER COUNTRY.....	Giles. Bland.
	CLINCH RIVER COUNTRY.....	Tazewell. Russell. Scott.
	SOURCES OF SANDY RIVER, or TRANS-APPALACHIA.....	Lee. Buchanan. Wise.

AREAS AND POPULATION.—Before describing these Divisions, or even the State as a whole, it is best to present the facts of area and population, so that proper ideas may be formed of the relative size and present condition of each and of the whole; also comparative statistics concerning other well known countries.

TABLE I—AREAS AND POPULATION.

	COMBINED NATURAL AND POLITICAL AREAS, &C.						NATURAL AREAS.	
	Square Miles.	Statute Acres.	Population, 1870.	Population to Square Mile.	45-ths of State.	1,000-ths of State.	Areas of Natural Divisions.—Sq. miles.	1,000-ths of State.
Tidewater.....	11,350	5,664,000	346,305	30.5	11	.252	11,350	.252
Middle.....	12,470	7,980,800	363,932	29.2	12	.277	12,470	.277
Piedmont.....	6,680	4,276,200	207,204	32.5	7	.149	6,000	.133
Blue Ridge.....	1,230	787,200	23,553	23.2	1	.027	2,500	.056
The Valley.....	7,550	4,332,000	197,967	26.2	8	.163	5,000	.111
Appalachia.....	5,720	3,650,800	81,197	14.2	6	.127	7,680	.171
Virginia.....	45,000	27,201,000	1,225,163	27.2	45	1.000	45,000	1.000

The area of Tidewater includes 2,500 square miles of tidal waters; that of Piedmont all the eastern slope of the Blue Ridge; in that of the Blue Ridge, only the southwestern expansion of this mountain range is included; that of the Valley embraces the western slope of the Blue Ridge, and a strip along the western side

of the Valley from Appalachia; the latter does not include the strip just named; in short, the first column gives the area of each section, as nearly as may be, as the aggregate of its counties. In the last two columns an effort is made to give the areas of each according to *natural bounds*. The first is given because all the statistics are gathered for counties, and must be so used in comparisons. The fifth column gives an approximation of relative areas, the Blue Ridge being the unit of comparison. The sixth column gives the actual proportion of the divisions as used in this summary. The sections, arranged by *natural areas* in 100-ths, would stand: 1st. Blue Ridge, 6; 2nd. Valley, 11; 3rd. Piedmont, 13; 4th. Appalachia, 17; 5th. Tidewater, 25; 6th. Middle, 28. So nearly one-fourth of the State is mountain region, and one-fourth is Tidewater, leaving one-fourth for the plains of the Middle Country, and one-fourth for the rolling regions of the Valley and Piedmont.

As presented in this summary, one-fourth of the State is Tidewater, over one-fourth Middle, nearly one-seventh Piedmont, over one-thirty-third Blue Ridge; one-eighth is Appalachian, and one-sixth Valley country. Tidewater and Middle are each nearly twice the size of Appalachia or Piedmont.

COMPARISONS.—The following table presents some of the same facts in regard to other states and countries:

TABLE II.

STATE.	Square Miles.	Population.	Population to Square Mile.
England	(2) 50,922	(4) 22,704,108	445.8
Scotland.....	(2) 38,720	(4) 3,358,613	86.7
Belgium.....	(1) 11,372	(5) 4,984,500	438.2
Holland	(1) 12,680	(6) 3,552,700	280.2
New York.....	(3) 47,000	(3) 4,382,759	93.3
Pennsylvania.....	(3) 46,000	(3) 3,521,551	76.6
Massachusetts	(3) 7,800	1,457,351	186.8
Connecticut.....	4,750	537,454	113.2
Saxony	5,779	(7) 2,426,200	419.3
Brunswick.....	1,425	(7) 303,401	212.9
Württemberg.....	7,532	(7) 1,778,500	236.1
Maryland.....	11,124	(3) 780,894	70.2
Switzerland	15,722	2,510,494	159.6

(1) Guyot; (2) Reynolds; (3) U. S. Census 1870; (4) in 1871; (5) 1865; (6) 1866; (7) 1867.

Table II. shows that Tidewater and Belgium, Middle and Holland, Piedmont and Württemberg, Blue Ridge and Brunswick, The Valley and Massachusetts, Ap-

palachia and Saxony do not differ much in area, although very materially in density of population. If Virginia were peopled like England, it would have 19,600,000 inhabitants, one-half the present (1870) population of the United States;—it has a capacity for production equal to their support.

SURFACE.—(1). **TIDEWATER VIRGINIA** is divided by the waters of Chesapeake bay and the large tidal rivers that flow into that great estuary, into nine principal and a large number of secondary peninsulas. This is mainly an alluvial country, a portion of the Tertiary, Atlantic tidewater plain, and its surface, composed of sands and clays, is thrown into low flat ridges forming the water-shed of the peninsulas, succeeded by terraces and plains down to the water's edge, where they meet the swamps and salt marshes that always accompany well developed, land-locked, tidal waters. But little of this section is as much as 100 feet above the sea. This is the clay, marl and sand region.

(2). The **MIDDLE COUNTRY** is a wide, undulating plain, crossed by many rivers that have cut their channels to a considerable depth, and are bordered by alluvial bottom lands. Sandstones and granitic rocks abound.

(3). **PIEDMONT** is a diversified region, with many broken ranges of hills and mountains, enclosing valleys of many forms, or with streams bordered by narrow bottom lands winding among them; its hills are generally rounded in outline. In many places there are extensive plains. The crumbling greenstone and granite occur here.

(4). The **BLUE RIDGE** is a many-branched mountain range, expanding into plateaus or rising into domes, extending across the whole length of the State and forming one of its most prominent features. This is ribbed with hard sandstones and soft epidotic rocks.

(5). The **VALLEY** is a portion of the Great Central Appalachian Valley that extends for hundreds of miles from Canada to Alabama—a broad belt of rolling country, enclosed between lofty mountain ranges, diversified by hills and valleys, with many winding streams of water. The Blue Ridge is on the east, and the Kitatinny, or “Endless Mountains,” on the west. This is a region of limestone rocks, shales, slates and clays.

(6). The **APPALACHIAN COUNTRY** is made up of a number of parallel mountain chains, with trough-like valleys between them, the mountains often running for fifty or more miles as an unbroken, single, straight, lofty ridge, with an equally uniform valley alongside: sometimes the mountains die out and the valleys widen. Some of the mountain ranges and valleys are of sandstone, some of slates and shales, others of limestone; so there is here great variety of surface.

Some portions of the State are but little above the sea level; others are wide table lands, over 2,000 feet above the sea. No country can have more variety of surface.

INLAND WATERS.—The State has two systems of inland waters—(1) the Atlantic, and (2) the Ohio or Mississippi.

(1). The waters of the State, from Tidewater, Middle, Piedmont, the eastern slope of the Blue Ridge and the central part of the Valley, flow southeast to Chesapeake bay and Albemarle sound, following the inclination of the “Atlantic slope;” those from the northern portions of the Valley and Appalachia follow the moun-

tain ranges northeast to the Potomac, which river follows the southeasterly course before mentioned.

(2). The waters from the southwestern part of the Blue Ridge, the middle of the southwestern half of the Valley and Appalachia, flow northwest and north to the Ohio; those of the southwestern portions of the Valley and Appalachia flow southwest to the Tennessee. So the waters of the State flow in all directions.

PRINCIPAL RIVERS AND BRANCHES.—The waters belonging to the Atlantic system drain six-sevenths of the State. The principal streams of this system are: the Potomac, with its large branches—the Shenandoah and the South Branch, and its prominent smaller ones—Potomac creek, Occoquan river, Broad Run, Goose, Kittoctin and Opequon creeks—draining a large area of each of the sections of the State; the Rappahannock, with its Rapid Anne and numerous other branches flowing from the Blue Ridge across Piedmont, Middle and Tidewater, irrigating a large territory; the Pianketank, draining only a portion of Tidewater; the York, with its Pamunkey and Mattaponi branches, and many tributaries flowing from a considerable area of Middle and Tidewater; the James, with the Chickahominy, Elizabeth, Nansemond, Appomattox, Rivanna, Willis', Slate, Rockfish, Tye, Pedlar, South, Cowpasture, Jackson's, and many other inflowing rivers and streams of all kinds, gathers from a large territory in all the Divisions, draining more of the State than any other river. All these flow into Chesapeake bay. The Chowan, through its Blackwater, Nottoway and Meherrin branches and their affluents, waters portions of Middle and Tidewater. The Roanoke receives the Dan, Otter, Pig and many other streams, from the Valley, Piedmont and Middle Virginia, and then flows through North Carolina to Albemarle sound, joining the Chowan. The sources of the Yadkin are in the Blue Ridge.

The waters of the Ohio, a part of the Mississippi system, drain the remaining seventh of the State; but they reach the Ohio by three diverse ways. The rivers are: The Kanawha or New River, that rises in North Carolina, in the most elevated portion of the United States east of the Mississippi, flows through the plateau of the Blue Ridge, from which it receives Chestnut, Poplar Camp, Reed Island and other creeks, and Little river; across the Valley, where Cripple, Reed and Peak's creeks join it; across Appalachia, from which Walker's, Sinking, Big and Little Stony and Wolf creeks, and East and Bluestone rivers flow into it; and then through West Virginia into the Ohio, having cut through the whole Appalachian system of mountains except its eastern barrier, the Blue Ridge. The Holston, through its South, Middle and North Forks, Moccason creek, &c., drains the southwestern portions of the Valley and Appalachia; and the Clinch, by its North and South Forks, Copper creek, Guest's and Powell's rivers, and many other tributaries, waters the extreme southwest of the Appalachian country. These flow into the Tennessee. A portion of the mountain country gives rise to the Louisa and Russell's Forks of the Big Sandy river, and to some branches of the Tug Fork of the same river, the Tug forming the Virginia line for a space: these flow into the Ohio by the Big Sandy.

These are but a few of the thousand or more named and valuable streams of Virginia. They abound in all portions of the State, giving a vast quantity of water power, irrigating the country, furnishing waters suited to every species of fish, giv-

ing channels for tide and inland navigation, and enlivening the landscapes. Springs are very numerous, many of them of large size. Nearly every portion of the State is well watered.

THE NATURAL GRAND DIVISIONS.

(1). **TIDEWATER VIRGINIA** is the eastern and southeastern part of the State that on the south borders North Carolina 104 miles; on the east has an air-line border of 120 miles along the Atlantic; on the west is bounded by 150 miles of the irregular outline of the Middle country, (this would be 164 miles if it took in the mere edge of Tidewater along the Potomac up to Georgetown). The shore line of the Potomac and Chesapeake bay for 140 miles, and a line of 25 miles across the Eastern Shore, separate it from Maryland on the north. The whole forms an irregular quadrilateral, averaging 114 miles in length from north to south, and 90 in width from east to west, making an area of some 11,350* square miles, including some 2,500 square miles of valuable tidal waters.

The latitude is from $36^{\circ} 30'$ to $38^{\circ} 54'$ north, corresponding to that of the countries bordering on the northern shores of the Mediterranean in Europe; to Asia Minor, China and Japan in Asia; and to the central belt of States—Kentucky, Missouri, California, &c.—in the United States. The longitude is from $75^{\circ} 13'$ to $77^{\circ} 30'$ west from Greenwich—that of Maryland, central Pennsylvania and New York in the United States, and Ontario in Canada on the north, and of North Carolina, the Bahamas, Cuba, &c., on the south.

This is, emphatically, a *Tidewater* country, since every portion of it is penetrated by the tidal waters of Chesapeake bay and its tributary rivers, creeks, bays, inlets, &c., which cover some 2,500 square miles of surface, and give nearly 1,500 miles of tidal shore line. The united waters of nearly all this section, with those that drain 40,000 more square miles of country, or the drainage of 50,000 square miles (an area equal to that of England), flow out through the channel, 12 miles wide, between capes Charles and Henry—the “Virginia Capes”—into the Virginian Sea of Captain John Smith, along the eastern border of which, 50 or 60 miles from the land, runs the ever-flowing Gulf Stream, that great highway of the Atlantic, bearing the waters and inviting the commerce of Virginia to the British Isles and Western Europe.

The size of Tidewater Virginia is about the same as the State of Maryland or the Kingdom of Belgium; it would make 15 counties of the dimensions of Surrey in England. Belgium has a population of five millions, while this section has one-third of one. There were 30 people to a square mile in Tidewater in 1870, or over 31 acres for each: in Great Britain and Ireland in 1867 it was 250 to the square mile, and in Belgium in 1865 it was 438.

Tidewater is *naturally divided* into *nine principal peninsulas*, and these are subdivided into a great number of smaller ones, giving a wealth of outline not even surpassed by the famous Morea of Greece—in truth, there are here dozens of Mo-reas. These peninsulas are, *politically*, each divided into counties (thirty in all)—most of them laid out and named when this, the first settled portion of English-

* In the absence of actual surveys the areas can only be approximated.

speaking America, was a British colony—and the names given them were those of the counties or worthies of England, the “Mother Country,” at the time.

The *first peninsula*—taking them from the north to the south—is THE NORTH-ERN NECK, 75 miles long and from 6 to 20 wide, extending southeast, from the Middle Country to the bay, between the Potomac and Rappahannock. Its counties are King George, Westmoreland, Richmond, Northumberland and Lancaster. This peninsula is almost surrounded by navigable waters.

The *second*, or MIDDLESEX PENINSULA, extends southeast for 60 miles, with a breadth of from 3 to 10, between the Rappahannock and the Pianketank rivers, including Essex and Middlesex counties. The Rappahannock is navigable all along one side and the Pianketank nearly half of the other. This is one of the short peninsulas succeeding a long one.

The *third*, or GLOUCESTER PENINSULA, reaches southeast from the Middle Country, between the Pianketank and the York and its extension, the Mattaponi, some 70 miles to the Bay, where it is “forked” by the Mobjack bay. Its width is from 6 to 18 miles. It includes King & Queen, Mathews and Gloucester counties.

The *fourth*, the KING WILLIAM or PAMUNKEY PENINSULA, a short one, extends 60 miles southeast, between the Mattaponi and the Pamunkey (the streams that form the York). This is from 3 to 14 miles wide, and includes the counties of Caroline and King William, although the former extends across the neck of the *third* peninsula to the Rappahannock.

The *fifth*, a long one, is known as “THE PENINSULA,” by way of eminence, as it was the first settled, and Williamsburg, its chief town, was the Colonial capital of Virginia. This stretches 100 miles to the southeast, with a width of from 5 to 15 miles, between the Pamunkey and its extension the York on the north and the Chickahominy and the continuing James on the south. This large peninsula extends from the Middle Country to the Bay, and looks out between “The Capes.” Its counties are Hanover, New Kent, James City, York, Warwick and Elizabeth City.

The *sixth*, the short, RICHMOND or CHICKAHOMINY PENINSULA, between the Chickahominy and the James, is 50 miles long and from 5 to 15 wide, divided into Henrico and Charles City counties—the former contains Richmond, the capital of Virginia, a flourishing commercial and manufacturing city.

The *seventh*, or SOUTHSIDE PENINSULA, embraces all the country south of the James and between it and the Nansemond river and the North Carolina line. This is the last peninsula trending to the Southeast, which it does for 64 miles, with a width of from 35 to 40. Its counties are Prince George, Surry, Sussex, Southampton, Isle of Wight and Nansemond.

The *eighth* is the NORFOLK PENINSULA, including the counties of Norfolk and Princess Anne, the territory between the Nansemond river, Hampton Roads, Chesapeake bay and the Atlantic, some 30 by 35 miles in extent, protruding northward.

The *ninth*, THE EASTERN SHORE, is the peninsula extending to the south between Chesapeake bay and the Atlantic, divided between the large counties of Accomac and Northampton.

The last two are the UPPER TERTIARY PLAIN, raised but from twenty to thirty feet above the sea level, composed of north and south-lying belts of smaller penin-

sulas and islands, with the "pocoson" ends of the other peninsulas, forming the *first step* of the ascending stairway, or terraces of Virginia, to the westward. The shifting sands of its ocean shore are often elevated into dunes more than a hundred feet high.

The seven other peninsulas, with all their masses extended southeast and northwest, rise up as the *second* and *third* steps. The second step, corresponding in the main to the *Middle Tertiary Formation*, attains an elevation of from 80 to 120 feet above the sea. This is the widest tidewater terrace, gashed and broken by the broad estuaries that flow through it. The *third step* has its eastern edge just west of the meridian of 77° , and attains an elevation of from 90 to 150 feet above the sea, occupying the belt of *Lower Tertiary* country. Beyond this rises the *fourth step*, the border of granite and sandstone elevated from 150 to 200 feet above the sea, forming the rocky barrier over which the waters of the Middle or "upper country" fall, and up to which the tides of the "*low country*" come, making the "head of tide" for the Atlantic slope, and furnishing sites for manufacturing and commercial cities, where water power for manufacturing and tide power for commerce are found side by side. Here, half in Tidewater and half in Middle, on the *fourth* step and on the level of the first, on the hills and below them, are Petersburg, Richmond, Fredericksburg and Alexandria.

THE TIDEWATER PLAIN, then, has an average width of nearly 100 miles, and rises in three successive terraces to an elevation of about 150 feet. An inspection of the map will give a better idea of the many-shaped, lobed, gashed, notched and sea-penetrated character of this plain than words can convey. It is a fine, rolling, low country, with a surface diversified by salt water marshes and meadows, river bottoms, plains, upland, slopes and ridges, with a moderate proportion of "pocoson" or swamp country.

(2). The MIDDLE COUNTRY extends westward from the "head of tide" to the foot of the low, broken ranges that, under the names of Kittoctin, Bull Run, Yew, Clark's, Southwest, Carter's, Green, Findlay's, Buffalo, Chandler's, Smith's, &c., mountains and hills, extend across the State southwest, from the Potomac, near the northern corner of Fairfax county, to the North Carolina line, near the southwest corner of Pittsylvania, forming the eastern outliers of the Appalachian System, and that may, with propriety, be called the Atlantic Coast Range.

The general form of this section is that of a large right-angled triangle, its base resting on the North Carolina line for 120 miles; its perpendicular, a line 174 miles long, extending from the Carolina line to the Potomac, just east of and parallel to the meridian of $77^{\circ} 30'$ west, is the right line along the waving border of Tidewater which lies east; the hypotenuse is the 216 miles along the Coast Range, before mentioned, the border of Piedmont, on the northwest—the area of the whole, including the irregular outline, being some 12,470 square miles, or about the same as the Kingdom of Holland. Holland had in 1866 over three and a half million people; Middle Virginia in 1870 a little over one-third of a million—not 30 to the square mile in Middle Virginia, but 280 in Holland.

The latitude of this section is from $36^{\circ} 30'$ to 39° ; the longitude 70° to $79^{\circ} 40'$ west. So its general situation and relations are nearly similar to those of Tidewater.

The Middle Country is a great, moderately undulating plain, from 25 to 100 miles wide, rising to the northwest from an elevation of 150 to 200 feet above tide, at the rocky rim of its eastern margin, to from 300 to 500 along its northwestern. In general appearance this is more like a plain than any other portion of the State. The principal streams, as a rule, cross it at right angles; so it is a succession of ridges and valleys running southeast and northwest, the valleys often narrow and deep, but the ridges generally not very prominent. The appearance of much of this country is somewhat monotonous, having many dark evergreen trees in its forests. It needs a denser population to enliven it. To many portions of the Middle Country the mountain ranges to the west, of the deepest blue, form an agreeable and distant boundary to the otherwise sober landscape. There are a few prominences like Willis', Slate River and White Oak mountains farther east, only prominent because in a champaign country.

There can be but little natural grouping of the *political divisions* of the Middle Country, since there are but few great natural landmarks, unless James river, which crosses this section at right angles nearly midway, be considered as one, and the 25 counties of Middle Virginia be grouped as Northside and Southside ones. Many of these counties were laid out, named and settled in Colonial times also, and some of the oldest settled portions of the State are here.

The Northside counties are Fairfax, Alexandria, Prince William and Stafford, bordering on the Potomac; Spotsylvania between the Rappahannock and the North Anna, Louisa on the south of the North Anna (portions of Caroline, Hanover and Henrico properly belong here), Fluvanna and Goochland on the James—making 8 northside counties.

The 17 Southside counties are Buckingham, Cumberland, Powhatan and Chesterfield, between the James and Appomattox rivers; Appomattox on the James, Prince Edward, Amelia and Dinwiddie south of the Appomattox, and the two latter between it and the Nottoway—Nottoway is north of the river of that name; Campbell between the James and Staunton (or Roanoke) rivers, Charlotte north of the Roanoke, Lunenburg between the Nottoway and Meherrin, Brunswick and Greenville extending from the Nottoway (see Map) across the Meherrin to the North Carolina line—a portion of the latter county is in Tidewater; Pittsylvania and Halifax reach from Staunton across the Banister and the Dan to the North Carolina line, and Mecklenburg extends from the Meherrin across the Roanoke to the same boundary.

Portions of Fairfax, Prince William, Stafford, Spotsylvania, Caroline, Fauquier, Culpeper, Hanover, Henrico, Goochland, Powhatan, Chesterfield, Buckingham, Cumberland, Prince Edward, Campbell and Pittsylvania, which are on the Triassic, or New Red Sandstone formation, differ considerably in appearance from the rest of the Middle Country which is on the Eozoic, or granite, gneiss, &c., rocks.

This section is essentially the same as the rest of the Eozoic belt that extends from the Alabama river to the St. Lawrence, embracing large portions of the best sections of Alabama, Georgia, South Carolina, North Carolina, Maryland, Pennsylvania, New York and all the New England States. The cities of Atlanta, Raleigh, Petersburg, Richmond, Fredericksburg, Alexandria, Washington, Baltimore, Philadelphia, New York, New Haven, &c., are situated, in whole or in part, on these rocks.

(3). **PIEDMONT VIRGINIA** is the long belt of country stretching for 244 miles from the banks of the Potomac and the Maryland line southwest, along the eastern base of the Blue Ridge mountains, and between them and the Coast Range, to the banks of the Dan at the North Carolina line; it varies in width from 20 to 30 miles, averaging about 25; its approximate area is 6,680 square miles.

Its latitude corresponds with that of the State $36^{\circ} 30'$ to $39^{\circ} 27'$ north; its longitude is from $77^{\circ} 20'$ to $80^{\circ} 50'$ west.

This Piedmont country is the *fifth step* of the great stairway ascending to the west; its eastern edge, along Middle Virginia, is from 300 to 500 feet above the sea; then come the broken ranges of the Coast Mountains, rising as detached or connected knobs, in lines or groups, from 100 to 600 feet higher. These are succeeded by the numberless valleys, of all imaginable forms, some long, straight and wide, others narrow and widening, others again oval and almost enclosed, locally known as "Coves," that extend across to and far into the Blue Ridge, the spurs of which often reach out southwardly for miles, ramifying in all directions. Portions of Piedmont form widely extended plains. The land west of the Coast ranges is generally from 300 to 500 feet above the sea, and rises to the west, until at the foot of the Blue Ridge it attains an elevation of from 600 to 1,200 feet. The Blue Ridge rises to from 2,000 to 4,000 feet above the sea; at one point near the Tennessee line, it reaches a height of 5,530* feet: its general elevation is about 2,500, but its outline is very irregular.

Numerous streams have their origin in the heads of the gorges of the Blue Ridge, and most of them then flow across Piedmont to the southeast until near its eastern border, where they unite and form one that runs for a considerable distance along and parallel to the Coast mountains, and takes the name of some of the well known rivers that cross Middle and even Tidewater Virginia, like the Roanoke or Staunton, and the James. Some of these rivers break through the Blue Ridge from the Valley, making water gaps in that formidable mountain barrier, as the Potomac, the James and the Roanoke; but they all follow the rule above given in their way across this section.

This is a genuine "Piedmont" country—one in which the mountains present themselves in their grand as well as in their diminutive forms—gradually sinking down into the plains, giving great diversity and picturesqueness to the landscape, with its wealth of forms of relief as varied as those of outline in Tidewater. Few countries surpass this in beauty of scenery and choice of prospect, so it has always been a favorite section with men of refinement in which to fix their homes. Its population is 31 to the square mile, giving some 21 acres for each.

The *political divisions* of Piedmont are fourteen. Some of its counties have long been settled, and are highly improved. There are no natural groupings possible for these counties; they all, with three exceptions, run from the summit of the Blue Ridge across this belt of country. Taking them from the Potomac, the counties are: Loudoun, watered mostly by Goose and Kittoctin creeks and the Potomac; Fauquier, drained by the Rappahannock waters, to which river it extends; Rappahannock and Culpeper, on the southwest side of the same stream, Culpeper reach-

* Guyot's measurements.

ing to the Rapid Anne, as does also Madison; Greene and Orange, southwest of the Rapid Anne; Albemarle, drained by the Rivanna and Hardware branches of the James, and reaching to the James; Nelson and Amherst, bounded by the Blue Ridge and the James, Amherst by that river, both southeast and southwest; Bedford and Franklin, southwest of the James, and drained chiefly by waters of the Roanoke or Staunton; Patrick and Henry, next the North Carolina line, furnishing many branches to the Dan. An inspection of the map will show that every portion of this section is penetrated by water courses. Every portion of it is well supplied with unfailling, bright, pure water, from springs and mountain rivulets.

(4). THE BLUE RIDGE, for two-thirds of its length of 310 miles, is embraced in the Valley and Piedmont counties that have their common lines upon its watershed; it is only the southwestern portion of it, where it expands into a plateau, with an area of some 1,230 square miles, that forms a separate political division: still the whole range and its numerous spurs, parallel ridges, detached knobs and foot hills, varying in width from 3 to 20 miles, embracing nearly 2,500 square miles of territory, is a distinct region, not only in appearance but in all essential particulars. The river, in the gorge where the Potomac breaks through the Blue Ridge, is 242 feet above tide. The Blue Ridge there attains an elevation of 1,460 feet. Mt. Marshall, near and south of Front Royal, is 3,369* feet high: the notch, Rockfish Gap, at the Chesapeake and Ohio Railroad, is 1,996 feet, and James river, where it passes through the Ridge, is 706 feet above tide, or more than twice as high as the Potomac at its passage. The Peaks of Otter, in Bedford county, are 3,993† feet, and the Balsam mountain, in Grayson, is 5,700† feet, and in North Carolina this range is nearly 7,000 feet above the sea level. These figures show that this range increases in elevation as we go southwest, and every portion of the country near rises in the same manner. At a little distance this range is generally of a deep blue color. The whole mountain range may be characterized as a series of swelling domes, connected by long ridges meeting between the high points in gaps or notches, and sending out long spurs in all directions from the general range, but more especially on the eastern side, these in turn sending out other spurs, giving a great development of surface and variety of exposure.

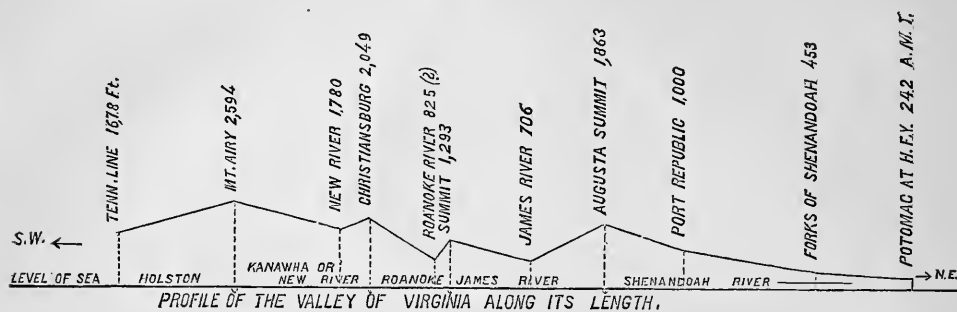
The *political* divisions upon the plateau of the Blue Ridge are the counties of Floyd, Carroll and Grayson, all watered by the Kanawha, or New river, and its branches, a tributary of the Ohio, except the little valley in the southwest corner of Grayson, which sends its water to the Tennessee. The population of this romantic section is 23 to the square mile.

(5). THE GREAT VALLEY OF VIRGINIA is the belt of limestone land west of the Blue Ridge, and between it and the numerous interrupted ranges of mountains, with various local names, that run parallel to it on the west at an average distance of some 20 miles, that collectively are called the Kitatinny or North Mountains. This valley extends in West Virginia and Virginia for more than 330 miles from the Potomac to the Tennessee line, and 305 miles of this splendid country are within the limits of Virginia. The county lines generally extend from the top of the Blue Ridge to the top of the second or third mountain range beyond the Valley proper,

*U. S. Coast Survey measurements.

†Guyot's measurements.

so that the political Valley is somewhat larger than the natural one, which has an area of about 6,000 square miles, while the former has 7,550, and a population of 26 to the square mile. The latitude of the Valley is from $36^{\circ} 35'$ N. to $39^{\circ} 26'$; its longitude is from $77^{\circ} 50'$ to $80^{\circ} 16'$ W.



While this is one continuous valley, clearly defined by its bounding mountains, it is not the valley of one river, or of one system of rivers, but of five; so that it has four water-sheds and four river troughs in its length, as shown in the above profile, *along* the Valley from the Potomac to the Tennessee line. These valleys and their length in the Great Valley are, from the northeast—

1st. The Shenandoah Valley,	- - - - -	136 miles.
2nd. The James River Valley,	- - - - -	50 "
3rd. The Roanoke River Valley,	- - - - -	38 "
4th. The Kanawha or New River Valley,	- - - - -	54 "
5th. The Valley of the Holston or Tennessee,	- - - - -	52 "
		<hr/> 330 miles. <hr/>

This profile shows that as a whole the Valley rises to the southwest, being 242 feet above the tide where the Shenandoah enters the Potomac and the united rivers break through the Blue Ridge at Harper's Ferry, and 1,678 feet where the waters of the Holston leave the State and pass into Tennessee. The entire Valley appears then as a series of ascending and descending planes, sloping to the northeast or the southwest. That of the Shenandoah rises from 242 to 1,863 feet along the line of its main stream, in 136 miles, looking northeast; those of the James slope both ways, from the Shenandoah summit to the southwest, and from the Roanoke summit to the northeast, and so on, as shown in the profile. This arrangement gives this *seventh* great step a variety of elevations above the sea from 242 to 2,594 feet, or even to 3,000, in a great enclosed valley, sub-divided into very many minor valleys, giving "facings" in all directions; for the whole Valley has a very decided southeastern inclination, to be considered in this connection, its western side being from 500 to 1,000 feet in surface elevation above its eastern, presenting its mass to the sun, giving its streams a tendency to flow across it toward the east, as the result of its combined slopes, and making the main drainage way hug the western base of the Blue Ridge. A moment's reflection and an inspection of the map will show that this is a well watered country, having a wealth of water power and drainage and irrigation resources almost beyond estimate.

The aspect of this region is exceedingly pleasant. The great width of the Valley; the singular coloring and wavy but bold outline of the Blue Ridge; the long, uniform lines of the Kitatinny mountains, and the high knobs that rise up behind them in the distance; the detached ranges that often extend for many miles in the midst of the Valley, like huge lines of fortifications—all these for the outline, filled up with park-like forests, well cultivated farms, well built towns, and threaded by bright and abounding rivers, make this a charming and inviting region.

The fifteen counties of the Valley—its *political* divisions—are naturally grouped by the river basins, to which their lines generally conform.

The noted SHENANDOAH VALLEY has, in Virginia, in the northeast Frederick and Clarke counties, reaching from the North Mountains to the Blue Ridge across the Valley, watered by the Opequon creek and the Shenandoah river and branches; Shenandoah county, extending from the mountains west to the Massanutton range, that for 50 miles divides the Valley into two, one watered by the North and the other by the South Fork of the Shenandoah; Warren, that lies at the confluence of these forks and between the Massanutton and the Blue Ridge, and Page county, between the same mountains and intersected by the South Fork; Rockingham, a large and noted county, reaching across the whole Valley, and holding the sources of the North Fork; and Augusta, the largest county, also occupying the width of the Valley, and containing the head springs of the Shenandoah. These seven counties occupy the whole of this well-known, fertile and wealthy valley.

In the *valley of the James* are Rockbridge and Botetourt, two fine counties in the heart of the valley, both extending across it, the former watered by the North and South rivers of the James, and that river and other tributaries, and the latter by the much-developed James river and Catawba, Craig's and other creeks. The mountain scenery of Rockbridge is especially noted.

In the *valley of the Roanoke* is the small but rich county of the same name: portions of Botetourt and Montgomery are drained by that river also.

The *Kanawha* or *New River valley* has Montgomery, Pulaski and Wythe counties, famous ones for grazing and stock, that reach from mountain to mountain. This is the most elevated portion of the Great Valley, and many people foolishly continue to call the water-shed between the Roanoke and New river, where that "divide" crosses the Valley, the Alleghany Mountain—saying that Christiansburg is on the top of the Alleghany—when there is no mountain there, only a "water divide" in the continuous limestone valley—because, *before* anything was known of the country or its peculiarities, it was supposed that the Alleghany Mountain wound its way everywhere, *over* and *under* mountains and valleys, to keep the waters of the Mississippi from those of the Atlantic. The Alleghany Mountain, as every well informed person knows, is a single, well-defined range, that begins just south of the White Sulphur Springs and runs northeast to and beyond the Potomac.

In the *valley of the Holston* or *Tennessee* are the two fine counties of Smyth and Washington, with soils of rare fatness.

(6). APPALACHIAN VIRGINIA, or APPALACHIA, succeeds the Valley on the west. It is a mountain country, traversed its whole length by the Appalachian or Alleghany System of mountains. It may be considered as a series of comparatively narrow, long, parallel valleys, running northeast and southwest, separated from

each other by mountain ranges that are, generally, equally narrow, long and parallel, and quite elevated. In crossing this section to the northwest, at right angles to its mountains and valleys, in 50 miles one will cross from 6 to 10 of these mountain ranges, and as many valleys. As before stated, a strip of this region is embraced in the Valley counties, as they include the two or three front ranges that have drainage into the Valley; so that some 900 square miles of Appalachia are politically classed with the Valley, leaving 5,720 square miles to be treated of here. This, in Virginia, is an irregular belt of country 260 miles long, varying in width from 10 to 50 miles. Its waters, generally, flow northeast and southwest, but it has basins that drain north and northwest, and south and southeast. The heads of the valleys are generally from 2,000 to 2,800 feet above tide, and the waters often flow from each way to a central depression—that is, from 600 to 1,200 feet above sea level—before they unite and break through the enclosing ranges. The map shows this arrangement, as in the case of Potts' creek and the Cow-pasture river. Potts' creek heads in Giles county, at 2,698 feet of altitude, flows northeast 42 miles, a portion of the way as Jackson's river, to 1,036 feet of elevation at Clifton Forge, where the river turns southeast: the Cow-pasture has its sources in Highland county, at an elevation of about 3,000 feet, and flows southwest 48 miles to near the same point, where it unites with Jackson's river and forms the James. The remarks made concerning the slopes of the Great Valley apply also to this section, except that the Appalachian valleys are straighter.

The twelve counties of this section group very well as follows:

1st. The JAMES RIVER GROUP, the waters from which flow into that river, including Highland, on the water-shed of the James and Potomac, the South Branch of the latter having several of its sources there, with the Cow-pasture and Jackson's river branches of the former; Bath, crossed by the same branches of the James; Alleghany, through a portion of which the same rivers flow, and in which they unite, meeting the waters of Dunlap's and Potts' creeks from the southwest; and Craig, drained by Johns', Craig's and Barber's creeks, flowing from the southwest. Sinking creek of New river flows southwest from this county. All these waters but the last run into the James before it crosses the Valley.

2nd. The KANAWHA or NEW RIVER GROUP includes Giles, which is intersected by New river, into which flow from the northeast Sinking and Big and Little Stony creeks, and from the southwest Walker's and Wolf creeks; Bland, on the head waters of Walker's and Wolf creeks, just mentioned, and having also some of the springs of the Holston, that flows southwest.

3rd. The TENNESSEE RIVER GROUP, on the waters of that river, embraces Tazewell, on the divide of New and Tennessee, (the lowest gaps of which are 2,116 feet above tide); Wolf creek, Bluestone and East rivers run from this county northeast into New river, while the North and the Maiden Spring Forks of Clinch flow southwest: Russell is southwest of Tazewell, and the Clinch and its Copper and Moccason creek branches run through it to the southwest: Scott is next, on the southwest, and the same streams pass through it from Russell, and the North Fork of the Holston besides, all running southwest: Lee is southwest of Scott, Powell's river and its numerous branches flowing southwest from it to the Clinch. All these

aters unite in the State of Tennessee, and form the river of that name. The land of the counties of this group is exceedingly fertile, large portions of it being limestone, and its exposure to the southwest, and the situation and elevation of its surrounding mountains, secure to it a *very mild* climate.

4th. The SANDY RIVER GROUP includes Buchanan county, drained by the Tug, Louisa and Russell's Forks of the Big Sandy, flowing northwest; and Wise county, drained by Russell's and Pound Forks of the same river, and a portion by the Guest's river branch of the Clinch, and some head springs of Powell's river. These two counties really belong to the TRANS-APPALACHIAN country, the great plain that slopes from the parallel ranges of mountains to the northwest, from which the waters have eroded their deep channels. They cover Virginia's part of the Great Carboniferous formation, and give her a most valuable coal field.

Appalachia is noted as a grazing country, its elevation giving it a cool, moist atmosphere, admirably adapted, with its fertile soil, to the growth of grass and the rearing of stock of all kinds.

CHAPTER II.

THE GEOLOGY OF VIRGINIA.

SECTION I.—THE GEOLOGICAL FORMATIONS.

The Geology of Virginia was determined by Professor William B. Rogers, the distinguished Geologist of the State, in a survey conducted for that purpose from 1835 to 1840, and much of the brief outline here given is condensed from his reports. The accompanying geological map of the Virginias was most kindly colored by Professor Rogers especially for this work.

The geological formations found in Virginia; like its geographical divisions, succeed each other in belts, either complete or broken, nearly parallel to the coast of the Atlantic. In fact the geographical divisions of the State that have already been given correspond in the main to the different geological formations, and have been suggested by them; hence those divisions are *natural*.

The formations developed in Virginia, taken in the order in which they succeed each other and cover the surface, or form the rocks found with the surface, from the Atlantic at the Virginia Capes to the northwest across the State, are as follows:

GEOGRAPHICAL ORDER OF FORMATIONS.

TIDEWATER.	{	1. Quaternary.
		2. Upper Tertiary.
		3. Middle Tertiary.
		4. Lower Tertiary.
MIDDLE.	{	5. Triassic and Jurassic.
		6. Azoic and Granitic.
PIEDMONT.	}	7. Azoic, Epidotic, &c.
BLUE RIDGE.	}	8. Azoic and Cambrian.
THE VALLEY.	}	9. Cambrian and Silurian.
APPALACHIA.	{	10. Sub-Carboniferous and Devonian.
		11. Silurian.
		12. Devonian and Sub-Carboniferous.
		13. Great Carboniferous.

The GEOLOGICAL ORDER OF THESE FORMATIONS, arranged according to the recognized age of the rocks, from the newest to the oldest, is this:

Cenozoic, or TERTIARY.	{	1. Quaternary (and Alluvium?)	}	<i>Tidewater.</i>
		2. Upper Tertiary.		
		3. Middle Tertiary.		
		4. Lower Tertiary.		
Mesozoic, or SECONDARY.	{	5. Triassic and Jurassic (and Cretaceous?)	}	<i>Middle.</i>
		6. Great Carboniferous Series.		
Paleozoic, or TRANSITION.	{	7. Sub-Carboniferous.	}	<i>Appalachia.</i>
		8. Devonian.		
		9. Silurian and Cambrian.		
Eozoic, or PRIMARY.	{	10. Azoic, Granitic, &c.	}	<i>Valley and Appalachia.</i>
				<i>Middle, Piedmont and Blue Ridge.</i>

The chief Geological Sub-Divisions shown on the accompanying map,* are:

- (1). The Upper Tertiary, passing into Quaternary.
- (2). The Middle and Lower Tertiary.
- (3). The Triassic and Jurassic Beds.
- (4). The Great Carboniferous, down to the base of the Seral Conglomerate.
- (5). The Sub-Carboniferous, including Umbral limestones, shales and slates, and at the base Vespertine sandstone, having coal in some places.
- (6). The Devonian sandstones, slates and shales, from top of Meridian to top of Ponent.

(7). The Cambrian and Silurian—Primal to top of Meridian.

(8). The Azoic and Granitic Group—Syenite; Mica, Tale and Hornblende Slates, Argillaceous Slates, Auriferous Quartz, &c.

Professor William B. Rogers, in his Reports on the Geology of Virginia, described the formations of the State as follow†:

- (1). Tertiary. { Miocene=(*The Middle Tertiary*).
Eocene=(*The Lower Tertiary*).
 - (2). Middle and Upper Secondary=(*The Triassic and Jurassic*).
 - (3). Primary and Metamorphic Rocks (including beds of limestone)=(*The Azoic and Granitic Group*).
 - (4). Formation No. I.
 - (5). Formation No. II.
 - (6). Formation No. III.
 - (7). Formation No. IV.
 - (8). Formation No. V.
 - (9). Formation No. VI.
 - (10). Formation No. VII.
 - (11). Formation No. VIII.
 - (12). Formation No. IX.
 - (13). Formation No. X.
 - (14). Formation No. XI.
 - (15). Formation No. XII. —Coarse Sandstones.
 - (16). Formation No. XIII. —Lower Coal Group.
 - (17). Formation No. XIV. —Lower Shale and Sandstone Group.
 - (18). Formation No. XV. —Upper Coal Group.
- { (*The Cambrian and Silurian*).
 { (*The Devonian*).
 { (*The Sub-Carboniferous*).
 { (*The Great Carboniferous*).

* As named and colored by Professor William B. Rogers.

† The equivalents of the map are given in italics in parentheses.

The various geological formations have received different names, and been differently classified in various states and countries, and as it is desirable, for many reasons, to know the equivalent names, those of the more important systems are here given.

SYSTEMS OF GEOLOGICAL CLASSIFICATION COMPARED.

Early Writers	Eras.	Ages.	Periods.	New York System.	Pennsylvania and Virginia Names—H. D. & W. B. Rogers.	Names used in Virginia Reports—W. B. Rogers.
Tertiary.	Psychozoic.	Age of Angiosperms and Palms.	Quaternary.			
	Cenozoic Time.	Age of Mammals.	Tertiary.			Pliocene. Miocene. Eocene.
Secondary.	Mesozoic Time.	Age of Cycads.	Cretaceous.			
		Age of Reptiles.	Jurassic.			
			Triassic or New Red Sandstone.			Middle and Upper Secondary.
Transition.	Paleozoic Time.	Age of Coal Plants, Amphibians & Actinogens.	Permian.			
			Carboniferous.	Lower Carboniferous.	Seral. Umbral. Vespertine.	Formations No. XV. to No. X. inclusive.
		Age of Fishes, Algae & Actinogens.	Devonian or Old Red Sandstone.	Catskill. Chemung. Hamilton. Corniferous.	Ponent. Vergent. Cadent. Post-Meridian.	Formations No. IX. and No. VIII.
		Age of Mollusks and Algae.	Silurian.	Oriskany. Heidelberg. Sallina. Niagara..... {	Meridian. Pre-Meridian. Scalent. Surgent. Levant.	Formations No. VII. to No. I. inclusive.
			Cambrian.	Hudson. Trenton. Potsdam.	Matinal. Auroral. Primal.	
Primitive.	Azoic Time, or Eozoic.		Metamorphic.	Taconic or Huronian. Laurentian.	Crystalline Schists. Azoic.	Metamorphic. Primary.

The *first "dry land"* of the State that appeared was the country between the western base of the Blue Ridge and the eastern side of the Middle country at the head of tide; its borders were the shores of the ocean east and west. So Middle, Piedmont and Blue Ridge Virginia are the *oldest* portions of the State; they are based on Granite, Gneiss and Syenite; Mica, Talc and Hornblende Slates, Argillaceous Slates, Auriferous Quartz, &c.; *the region is Eozoic or Primary.*

The *second formed land* was the Great Valley, a broad belt of seacoast along the shore of a subsiding ocean, where corals were abundant, making it a limestone region—the Cambrian and Lower and Upper Silurian—a country with sandstones and limestones of many varieties, together with slates and shales: a part of the *Transition* or Paleozoic period. So the Valley is the second oldest country in the State. These are followed by the Devonian rocks as third, and these in turn by the Sub-Carboniferous and Carboniferous as fourth and fifth, all in Appalachia. The sixth, the Triassic or New Red Sandstone, is only found as detached masses, deposits in depressions of the Primary, in the Middle country. The seventh, the *last formed* portion of the State, is the Tertiary, the entire Tidewater region, if we except the alluvium now forming on the shores.

TIDEWATER.—This is what the geologists call a Tertiary or lately formed region, one where the remains of plants and animals found in the rocks and soils do not differ greatly from the plants and animals now living—they belong to the same families. The beds of mineral substances here found are rarely converted into real rocks, but lie as beds of sand, gravel, clay, &c., much the same as when they were deposited in shallow waters by the ocean and inflowing rivers.

1st. *The Quaternary or Post-Tertiary** formation is the sandy shore, the mere margin, of the Atlantic and the Bay; it is like the shore land of Lincolnshire and other eastern counties of England.

2d. *The Upper Tertiary or Pliocene** is the *first step* or terrace of the State above the ocean; it is the low plain of the Eastern Shore and Norfolk peninsulas, where the surface is composed of "*light-colored sands and clays, generally of a fine texture, and never enclosing pebbles of large dimensions.*"† This is, geologically, a similar country to most of Suffolk in England, to the hills of Rome in Italy, and the territory around Antwerp in Belgium. *Underneath* this are found the other formations, in order, and their valuable marls can be reached, at no great depth, by going through this. The immense piles of shells found along the shores, and the refuse fish, furnish fertilizers adapted to the soils of this section.

3d. *The Middle Tertiary,‡ or Miocene,* is the surface of the *second* step of country, extending from the western border of the last described formation, where this passes *under* that, to a line running southward from Mathias Point, on the Potomac, to Coggin's Point on the James—a line just west of the meridian of 77°; from the

* These are together called Alluvium, in the recently published Statistical Atlas of the United States, by Professors Hitchcock and Blake.

† Rogers.

‡ The Middle and Lower Tertiary are together called Tertiary in the United States Statistical Atlas.

James south it inclines to the west. This formation, generally, descending from the surface, consists of the following materials:

1. Beds of coarse sand and gravel just under the soil, sloping in position.
2. Horizontal beds of sand and clay.
3. Yellow marl, underlaid by a conglomerate of fragments, with shells nearly entire but water-worn.
4. Yellow marl with friable shells and tenacious clay.
5. Upper blue marl—a clay, bluish, of fine texture, rich in shells.
6. Lower blue marl—clay with more sandy materials, more shells and more varieties.
7. A thin band of pebbles, with ferruginous matter: the bottom of the formation.

In some parts of Tidewater some of these strata harden into a sort of limestone, or into sandstones, very good for building purposes. Of course the Lower Tertiary *underlies* this as this underlies the Upper, and is overlapped by it. This formation covers a large portion of the Atlantic plain and of the lower Mississippi valley of the United States; it is the formation of the valley of the Columbia in Oregon and of the valleys of California; in Europe it forms the Gironde and Landes of France and the basin of Vienna; in England it is the New Forest region of Hampshire and Dorset, the country around Portsmouth and Southampton.

4th. *The Lower Tertiary or Eocene.* This formation underlies both the others and forms the surface of the remainder of Tidewater west of the line already described as forming the western boundary of the Middle Tertiary: it is a strip of country some 15 miles wide along the "head of tide." The fossils found in this are more unlike the forms now existing. This *greensand* marl formation on the east pushes its headlands into the Middle Tertiary, and on the west fills up the ravines between the headlands of sandstone, granite, &c., that protrude into it from the Middle country.

The following section,* from the banks of the Potomac, below Aquia creek, will give an insight into the composition of this group of "rocks":

- (1). The soil.
 - (2). 20 feet of yellow clay, impregnated with sulphates.
 - (3). 5 feet of sulphur-colored clay, containing shells.
 - (4). 3 feet of rock, resembling marl in color and composition.
 - (5). 12 feet of yellowish gray marl, specked with greensand and abounding in shells.
- 40 feet, the level of the Potomac.

In some places the marl of this Eocene contains so much carbonate of lime from the shells distributed through it, it has become a *limestone*. Here are also beds of *blue marl*, *shell-rock*, *gypsaceous* and acid clays, dark bluish clay and sand containing sulphates of iron and lime. There are also beds of sand and gravel, coarse and often cemented by iron. In all of these there is great variety of color and composition. The strata are slightly inclined, generally to the southeast. This is the formation on which the most of Essex, Middlesex, Kent, &c., counties around London in England, are situated—the region of the noted London clay. (The same

* As before stated, the data here used are from Professor Rogers' Reports.

material abounds in Virginia.) The Isle of Wight, Dorset, Wilts, Hants, Suffolk, Norfolk, Cambridge and Lincoln counties, the most productive in England, are in the Lower Tertiary; the cities of Liverpool and Paris are also on it.

5th. *The Triassic or New Red Sandstone* is sometimes found as transported fragments from that formation, (which forms a part of the western boundary of this section,) scattered over the surface of some of the peninsulas southeast from where this rock is found in place.

6th. *The Azoic or Primary Rocks*, which underlie all the others and also form part of this western border, are sometimes found as headlands thrust into the Tertiary or as islands in its surface.

MIDDLE COUNTRY.—The larger portion of this region is Azoic,* or Primary. The rocks contain no organic remains; they are crystalline in their character, generally stratified, dip at a high angle either to the southeast or the northwest, or are nearly vertical, rarely horizontal, and their exposed edges, or "strike," run northeast and southwest. The strata vary in thickness from the fraction of an inch to many feet.

The rocks of this formation are: *Gneiss*, (a name given to any crystalline, stratified rock composed of quartz and felspar, mixed with smaller quantities of hornblende, mica, or other simple minerals,) the most abundant, which along the east side of the Middle country is a gray rock, consisting of quartz, felspar and black mica, with some spangles of white, and grains of hornblende—this is the fine Richmond granite. In some of the layers of this rock the felspar predominates, and the rock crumbles on exposure. The finer grained gneiss is generally called granite, the coarser Syenite, or Syenitic granite; the former are quartzose, the latter felspathic. Next, going westward, are other varieties of gneiss more slaty in structure, containing more felspar and hornblende, (quartz is the *flint* rock, felspar is softer and duller in color, hornblende is dark green or black,) and are more decayed, sometimes into beds of porcelain clay or kaolin. These are succeeded, on the western border of this section, by a broad belt of *micaceous, talcose* and *argillaceous* slates, according to the ingredient predominant in the rock, whether mica, talc or soapstone, or alumina. The rocks on the east side of this slaty belt are most micaceous on the west talcose. In these belts are some beds or small tracts of chloritic gneiss, slate, steatite, serpentine, &c., making spots noted for fertility like the Green Spring country in Louisa county. In the more argillaceous part of this belt, the western side next to Piedmont, some of the slates become so sandy they pass as sandstones or conglomerates, (gneissoid sandstones,) and among these are found roofing slates and a fragmentary belt of limestone. Through the centre of this region runs the "gold belt," where gold is found in quartz veins, interstratified with the other rocks; here are also veins of various kinds of iron and copper ores. This formation covers large areas of valuable country in all parts of the world.

In this Middle section, as before stated, laid over the other rocks, (the granitic ones,) or filling depressions in them, are a number of patches of the Triassic† and Jurassic, or New Red sandstone rocks, sometimes called the Middle Secondary, and

* Called Eozoic in the U. S. Statistical Atlas of 1874.

† Classed with the Cretaceous as Mesozoic in U. S. Statistical Atlas.

generally known as "*brown stone*." The localities of this are: (a) the "Richmond coal-field," a large oval area in Chesterfield, Powhatan, Goochland and Henrico counties, inside Middle Virginia; (b) a small oval territory bordering Tidewater between Ashland and Milford stations on the Richmond and Fredericksburg railroad, and nearly divided by it; (c) a long, narrow strip, bordering Tidewater from several miles south of Fredericksburg, on, along the west bank of the Potomac, to near Mount Vernon; (d) a large wedge, nearly 600 square miles, resting for some twenty miles on the Potomac and extending southwest, between the Middle and Piedmont sections, to its apex on the Rapid Anne near Orange Courthouse, with a small outlying portion near that place, and extending beyond it towards Gordonsville; (e) a curved portion of land extending from Hampden Sidney College north through Farmville to Willis' river, and northeast along that river to near Cumberland Courthouse; (f) a narrow belt along James river from Scottsville, some 15 miles to the southwest; (g) a band of country some 60 miles long, extending from a point southeast of Campbell Courthouse southwest to the North Carolina line near Danville.

These rocks are of the kind known as sedimentary—composed of particles of sand and earth, and of pebbles derived from other rocks, and deposited by water where they now are. They are in strata, some of coarse conglomerate, with very large pebbles; others of finer material, making sandstones, slates and shales, generally *dark brown or red* in color, but sometimes gray, brownish gray or yellow, and greenish gray. They generally dip but little, being nearly horizontal. The "brecciated marble" of the Potomac is from this formation, as is also the "brown stone" from Manassas. In this formation are found remains of plants, as lignite or coaly matter, and of fishes; and in the Richmond, Danville and Farmville portions are valuable beds of rich bituminous coal.

PIEDMONT is in the same region of Primary, Azoic or Transition rocks as Middle, but they differ much in their characteristics.

The *gneiss* of Piedmont, from the Blue Ridge to the Southwest Mountain, is usually of a darker color and coarser texture than that of Middle Virginia, and it has much more variety in its structure and composition. Generally it contains more or less talce, or chlorite, not much mica, and very often hornblende and iron pyrites, the latter a powerful agent in decomposing rocks, and with hornblende giving a red tinge to the soil; so that this is often called the "Red-land" district. Near the base of the Blue Bidge are belts of granitic gneiss: also belts of micaceous, chloritic, argillaceous and talcose slates, generally narrow, with bands and patches of limestone. The *epidotic*, or greenstone rocks, form the chief mass of the broken Southwest Mountain, or Coast Range Chain, the eastern border of Piedmont. These rocks are of a greenish hue, with crystals of epidote and quartz. They weather into a yellowish soil that changes into orange and red, and is always fertile. Bands of iron ores of various kinds, slates, soapstone, &c., are found throughout this section.

THE BLUE RIDGE is the border land between the Azoic, Primary or Transition rocks, and the fossiliferous ones. Generally its eastern flank and summit, and sometimes a good portion of the western slope, are composed of the *epidotic* rocks

before mentioned, more highly epidotic than even those of Piedmont; and so it acquires peculiar geological characteristics. The epidote is found there compact, with quartz imbedded, as amygdaloid, &c. Here are also beds of epidotic granite, of whitish granite and of Syenite, with sandstones and slates of various kinds; but *epidote* is here more abundant than elsewhere, and this by decomposing makes the wonderful soil of this mountain range.

The western flank of the Blue Ridge is composed of the rocks of the Cambrian, Potsdam Sandstone, Primal, or Formation I. of Professor Rogers; for by all these names is known the "close-grained white or light gray sandstone," with beds of coarse conglomerate, brown sandstones and brownish olive-colored shales here found, that once made the eastern shore of a great *ocean*. In this formation are bands of specular iron ore and beds of hematite.

The VALLEY is the region of Cambrian and Lower Silurian rocks—Formations I., II. and III., of Rogers, or from Potsdam to Hudson River formations, of New York, inclusive—a country mainly of *limestone*, slate and shale rocks, with a fertile soil and undulating surface. The section across the Valley through Staunton gives some 30 alternating bands of slates and limestones of various kinds, some magnesian, others silicious, or rich carbonates; some compact, others flaggy or slaty, &c. Among these are beds of chert, iron ore, umber, lead, zinc, &c. This formation extends northward, and forms the rich Cumberland, Lebanon, and other valleys of Maryland, Pennsylvania and New Jersey, the Hudson and Mohawk valleys of New York, and the Champlain valley of Vermont. Southwest it becomes the valley of East Tennessee, and extends into Alabama, making a great Central Valley, some 1,500 miles in length, of unsurpassed fertility and productiveness. This formation underlies a large portion of Scotland, especially the southern and central parts; much of the area of Wales, and large districts in the west, southwest and northwest of England. It covers an extensive tract in Russia; is found in Spain, &c. The most fertile portions of New York, Ohio, Indiana, Kentucky, Wisconsin and Missouri are also underlaid by this rock.

Belonging to the Valley counties (the lines of which extend to the summit of the Blue Ridge, and cross, often, several ranges of the mountains west), of course we have the half of the summit and all the western slope of the Blue Ridge, already described. To it also, politically, will belong parts of the Upper Silurian and Devonian Systems, that are more especially referred to in the account of the Appalachian Country. These form long ridges that rise up and run for great distances in the Valley, like the Massanutton and other mountain ranges—making barriers that divide the Valley-lengthways into two parallel valleys. The rocks of the Valley generally dip to the southeast at a high angle. In some places there runs an axis through the Valley from which the rocks dip both ways, to the southeast and to the northwest, making an anticlinal. The upturned edges of the rocks strike, or run, northeast and southwest with the Valley.

Fragments of the Sub-Carboniferous formation are found along the western margin of the Valley, sometimes containing valuable beds of semi-anthracite coal,

as in Montgomery, Augusta and other counties. This formation consists of conglomerates, shales, sandstones, &c

The APPALACHIAN Country, beginning with the mountains on the west side of the Great Valley, is occupied chiefly by the Upper Silurian and Devonian rocks from IV. to IX. inclusive. It also shows narrow outcrops of Lower Silurian and important areas of Carboniferous rocks, comprising sandstones, slates, limestones, coal seams, &c. The sandstones hold up the high, parallel ridges or chains of mountains that run unbroken for such long distances; the slates and limestones form the rich valleys between. In these rocks are great continuous bands of hematite and fossil iron ores, among the most abundant and valuable in the world.

The DEVONIAN Rocks (or Old Red Sandstone—Rogers' VIII. and IX.; the Corniferous, Hamilton, Chemung and Catskill groups of New York) are found among those that have already been described, the convulsions of nature having exposed in successive ridges and valleys the different formations. Formation VIII. is composed of slates and slaty sandstones that often appear as low serrated ridges; the slates are black, olive, green and reddish, sometimes with calcareous bands; some of the shales contain copperas, alum and iron ore. Formation IX. is known by its red slates and sandstones alternating with green, yellow, brown and dark gray shales and slaty sandstones, with some iron ore.

The SUB-CARBONIFEROUS Rocks in Virginia, formations X. and XI., are confined to narrow belts made up of conglomerates, slates, shales and limestones, running along the southeast flanks of the North mountains. It is in Formation X. (Vespertine) that Rogers locates the coal of Augusta, Botetourt, Montgomery, &c. Formation XI. is very calcareous, and is the repository of the Gypsum and Rock-salt of Southwest Virginia (Rogers). This is the equivalent of the *Carboniferous limestone* of England. Great down-throws and upheavals of the rocks have brought the Carboniferous and Silurian formations in the southwestern portion of Appalachia side by side, and all the intervening formations are often wanting. Iron ore of good quality is found in the shales of this group.

The CARBONIFEROUS or true coal-bearing rocks, Rogers' XII. to XV., cover but a moderate area in Virginia, when compared with that occupied by the other formations; still the State has nearly a thousand square miles of territory that belongs to the great Carboniferous, in the Southwest, in that portion of it lying north of the Clinch river and drained by its western branches, and in the Virginia territory drained by the Sandy river, with some small adjacent areas. This formation is a group of sandstones, slates, bands of limestone and seams of coal that together make the great Appalachian coal field—one of the most remarkable in the world for the number, thickness, quality and variety of its seams of bituminous coal, and for their accessibility above water level.

The formations of Appalachia are the same as those that cover large portions of the States of New York, Pennsylvania, Ohio, Indiana, Michigan and Iowa. In Europe this formation occupies the Lowland region of Scotland, the country of

Edinburg and Glasgow, also the Cromarty and Caithness region; in England it underlies large areas in the northwest and southwest and in Wales.

SECTION II.—THE SOILS OF VIRGINIA.

THE CHARACTER OF THE SOILS OF VIRGINIA, as of other countries, is dependent on its geology: that understood, this becomes easy of comprehension.

TIDEWATER is a Tertiary region; its soils are the alluvial deposits, the sands and clays peculiar to that formation. The soil of the low, flat, sandy shores and islands is, naturally, thin, light and soft: at the same time it is warm, and under the influences of a mild climate, a near ocean and bay, and the dense crops of wild bent-grass, magothy bay-beans, &c., that grow and decay upon it, it becomes very productive and "*quick*." The salt-marshes of this region are rich in the elements of fertility, as is evidenced by the crops of grass they produce. The soil of the Eastern Shore peninsula is like that already described, only it rests upon a stiff clay, and so retains fertilizers applied to it and is easily improved. The soils of the Norfolk peninsula also belong to this class; they are light, warm, easily tilled, and respond quickly to the influence of fertilizers—all these may be characterized as *garden* soils, adapted to the hoe. In all this Upper Tertiary country there is much salt marsh and swamp land that, when properly drained, becomes exceedingly productive.

In every portion of Tidewater along the streams are "*first*" or alluvial bottoms, composed of mixed materials, the sediment of the waters—these, where above tide, or where protected by embankments, have a perpetual fertility.

The *second* bottoms, or second terrace above the waters, are called the "*rich lands*" of the country—they "are composed of loams of various qualities, but all highly valuable, and the best soils are scarcely to be surpassed in their original fertility and durability under severe tillage."* The subsoil is a dark red or yellow clay—the yellow becoming of a chocolate color on exposure—lying not very deep. These soils are drier and stiffer than those of the first bottom; sometimes they are sandy, but all are susceptible of improvement.

In some places there are spots of "*shelly*" soil, where the remains of oysters, mussels, &c., have decomposed and mingled with the loam and sand. These are permanently fertile, bringing forth abundantly. "*Shelly*" soils could be made anywhere in this region, for Providence has bountifully supplied the means by which this "*hint*" may be taken advantage of.

The *first* and *second* bottoms are not far above the water level, and form a comparatively small portion of the country. They are succeeded by the "*slope*," the incline that reaches back to the ridge or water-shed of the peninsulas. The soil of these slopes—compared with that on the flat ridges—"is of a higher grade of fertility, though still far from valuable," * * "generally more sandy than the poorer ridge land,"* and, when exhausted by injudicious cultivation, inclined to wash

* Edmund Ruffin's Calcareous Manures.

during rains. "The washing away of three or four inches in depth exposes a sterile sub-soil." Sometimes these soils are productive, but as a rule, do not wear. That they are not wanting in some of the elements of fertility, is well shown by the dense growth of pine trees that speedily covers them when abandoned by severe cultivation. Though thin, sandy and poor, and considered as almost valueless, these lands have been made fertile by using the marls and shells that are near by. The same can be done again. There is a large area of this land.

"The *ridge* lands are always level, and very poor, sometimes clayey, more generally sandy, but stiffer than would be inferred from the proportion of silicious earth they contain, which is caused by the fineness of its particles."* These evils "vary between sandy loam and clayey loam." Numerous shallow basins are found in these soils, which are filled with rain water in winter, and are dry in summer. The quantity of land in all the Tidewater country that pertains to the "slopes" and "ridges" is very large, but Mr. Ruffin has shown, by his cultivation and experiments, using the marls of the country as fertilizers, that they can be readily made productive.

Captain John Smith observes of the soil of Tidewater, which he knew when in a state of nature, in 1607: "The vesture of the earth in most places doth manifestly prove the nature of the soyle to be lusty and very rich." * * "Generally for the most part it is a blacke sandy mould, in some places a fat shiney clay, and in other places a very barren gravell."

The soils of the MIDDLE Country vary of course as the rocks do which they overlie. In the recently published Geology of New Jersey, speaking of a similar region in that State (page 68), it says: "Hitherto the country in which they† are found, has been considered poor and little capable of improvement. But gradually the farmer has been encroaching upon them, and turning these unpromising hills into fruitful fields. It is observed that the rocks are in many places subject to rapid decay, and that in such localities *the soil is susceptible of high cultivation.*" This report then gives an analysis of three varieties of felspar, common in the composition of the rocks there, and also in Middle Virginia, with the following results:

	Soda Felspar.	Potash Felspar.	Soda and Lime Felspar.
Silica	68.6	64.6	62.1
Alumina.....	19.6	18.5	23.7
Soda	11.8	.....	.....
Potash .....	.....	16.9	.....
Lime.....	.....	.....	14.2
	100.0	100.0	100.0

It has been found that the soda, and the soda and lime felspars, are more easily decomposed than the potash ones. It will readily appear that a soil containing the ingredients shown in the table must have the elements of fertility, and since there are numerous and wide belts of these in this section, we find here, upon these, fertile and productive soils. Along the streams, also, the transported materials of these easily decomposed rocks have been deposited, giving everywhere rich soils in the "bottom" lands. Where the beds of gray or light brown slate occur, the soil is not

* Ruffin.

† The Azoic rocks.

productive, but it has been found that lime renders the soil from these fertile. Wherever the rocks contain epidote, they decompose into a very fertile soil of a deep red hue. Sometimes these rocks cover considerable areas, and we find these noted for their fertility, like portions of Louisa, Buckingham, and the other counties of this section. There are also calcareous soils found in various portions of the Middle Country, where the patches of limestone before mentioned occur. These are always fertile. Some of the red soils of this section are derived from gneiss rocks containing sulphuret of iron, *but not epidote*. Such soils are as noted for sterility as the epidotic ones are for fertility.

The soils of the Triassic or New Red Sandstone belts are generally fertile, and easily worked. The composition of these rocks in New Jersey shows what they furnish to make a good soil. The Red Shale of the Triassic at Brunswick, N. J., gave, by analysis,* the following results:

Silicic acid and quartz.....	73.00
Peroxide of iron.....	10.00
Alumina	3.20
Lime.....	4.93
Magnesia	0.90
Potash.....	0.73
Soda	0.97
Sulphuric acid.....	a trace
Water	1.00

Other analyses of other rocks from this formation indicate the presence of a considerable percentage of lime, potash, soda, sulphuric acid, alumina, silica, &c., &c., all valuable ingredients of fertile soils. As a rule, the soils on the areas of this formation are among the best in this section.

The soils of **PIEDMONT**, and of its Southwest Mountain border, as remarked in Section I., are much more epidotic in their character, and therefore naturally more fertile than most of those farther east.

The red or chocolate colored soils of this section, formed from the decomposed, dark, greenish-blue sandstone here found, is generally considered the most fertile. This sandstone contains several per cent. of carbonate of lime. The other soils of this region are grayish or yellowish. These are by no means as fertile as the darker soils; but there are red soils here, as in Middle Virginia, that are also poor ones, and for the same reasons. The epidote rocks, from which the best soils of this region are formed, often contain, says Rogers, 24 per cent. of lime. Hornblende, in decomposing, forms a red soil also that is very fertile, but it contains magnesia, and less lime and alumina.

The soils of **Piedmont** are, many of them, undoubtedly among the most fertile known, and can be made to produce a great variety and abundance of crops. They are loose and easily worked, but care must be exercised in their management, since they are easily washed away by heavy rains. If neglected, they are soon covered by a growth of underbrush.

THE BLUE RIDGE is composed of much the same materials as **Piedmont**, only

* State Report.

they are richer in their abundance of greenstone rocks, which impart to the soils of this much expanded mountain range a wonderful fertility, and adapt them to the growth of rich grasses, vines, orchards and all the usual crops of the country wherever the character of the surface admits of cultivation.

The soils in the sandstone belt of the western slope of this range are sandy and poor.

The soils of the GREAT VALLEY are quite numerous; they are generally called limestone soils, as this is a limestone region. The prevailing soil is a stiff, clayey loam, a durable and fertile soil well adapted to the growth of grass and grain. In the slaty belts the admixture of the decomposed aluminous rocks makes a lighter and warmer soil. There are also belts of sandy or gravelly soil that are *cold* and require cultivation and fertilizers to make them productive, but once redeemed they yield very well. Much the larger portion of the Valley has, naturally, a good soil, rich in the elements of fertility. The soil, like the rocks, runs in belts, with the Valley, and the *lean* ones are the smaller number. The streams, as in all limestone regions, are very winding, so there is here a considerable area of *bottom* lands. Washington* said of this section that "in soil, climate and productions, and in my opinion will be considered, if it is not considered so already, as the Garden of America."

The soils of the APPALACHIAN region are very marked in their character; the sandstone ridges and mountains are very poor, while those made up of limestones and some of the shales are very rich; some of the slate valleys have a thin and poor soil, others on limestone or certain red sandstones are very rich: indeed, the natural exuberant fertility of some of these broad ridges and narrow valleys is something wonderful. Some of the little valleys are appropriately called "gardens." This region is so penetrated by streams that it has everywhere alluvial lands.

Thus it appears that there are soils of every variety, in Virginia, suited to all kinds of productions.

IN TIDEWATER: *peat-bottom*, or *swamp* and *savanna* lands, for cranberry culture; *salt marshes and meadows* for grass and cheap grazing; *river marshes* that reclaimed are fine hemp lands; *plains* with soft and warm soil for great market gardens and the rearing of delicate fruits; *river bottoms*, marly alluvial lands, excellent for cotton, corn, wheat, oats or meadows; thin, *sandy uplands*, for great sheep pastures and for forest planting.

IN MIDDLE: *clay soils* that produce the finest of wheat; *mixed sand and clay* well suited to general agriculture; *thin lands*, where fruit-growing would be remunerative; *river low-grounds*, where great crops of Indian corn and rank tobacco grow from year to year without exhausting their fertility; *light soils*, where the finer kinds of tobacco are produced; lands for Swedes, Mangolds, &c., and improved sheep husbandry.

IN PIEDMONT: *rich upland loams*, unsurpassed as wheat or tobacco lands, and producing heavy crops of cultivated grasses; *low grounds*, where the corn crop is always good, and where heavy shipping tobacco comes to perfection; *lighter soils*, where the vine and the apple produce abundantly; the best of lands for dairies and for sheep and cattle rearing.

* Letter to Sir John Sinclair, 1796.

IN THE BLUE RIDGE, where the natural grasses invite to sheep and cattle grazing, and the rich, warm soil and sunny exposures are adapted to fruit culture on lands that elsewhere would be too valuable for the plow.

IN THE VALLEY: the natural *blue grass lands*, the home of the stock-raiser and dairyman; the *heavy clay lands*, fat in fertilizing ingredients, always repaying the labor spent on them in crops of corn or wheat; the *lighter slaty lands*, famous for wheat crops; the poorer *ridge lands*, where sheep rearing should be followed.

IN THE MOUNTAIN REGION are great cattle ranges—lands where grass grows naturally as soon as the trees are cleared away and the sunlight admitted; rich meadow lands in the valleys well suited to dairying; fat corn or tobacco lands along the streams; lands for root crops along the slopes and on the plateaus.

SECTION III.—THE MINERALS OF VIRGINIA.

THE MINERAL RESOURCES of Virginia are very great, though as yet mostly undeveloped. They comprise gold, iron, copper, lead and zinc; semi-bituminous and bituminous coals; granite, limestone, marble, freestone, greenstone and brownstone; brick and fire-clays, glass sand, plumbago, manganese, gypsum, salt, &c., &c.

The TIDEWATER Country can hardly be called a mineral region, and yet it abounds in agricultural minerals, which to it, a country so well adapted to agriculture, are invaluable. The use of these can make this region everywhere fertile.

Among the AGRICULTURAL MINERALS, the *greensand marl* is first in importance. This mineral, so rich in carbonate and sulphate of lime, alumina, potash, &c., is found in extensive deposits in the Lower Tertiary formation, very accessible and convenient to navigation and railway transportation. The use of marls in the State of New Jersey has revolutionized its agriculture. More than a million tons of it were there applied in 1868.

The *blue marl* is hardly less valuable, containing often 40 per cent. of carbonate of lime; it is full of decomposed shells. This abounds everywhere in the Middle Tertiary, its beds being found near the level of the rivers. *White*, chalky-looking *marl* is abundant in portions of the Middle Tertiary. This is rich in calcareous matter, sometimes containing 75 to 95 per cent. of carbonate of lime. *Yellow marls* are also common. These are valuable for some soils. The iron in these often cements them into a kind of limestone. The noted "phosphate beds" of South Carolina are in a formation similar to that on the shores of Virginia, and such may yet be found here. *Peat*, valuable as a fuel and fertilizer, exists in the swampy plains.

THE ARCHITECTURAL MINERALS OF TIDEWATER are: the best of *clay* for brick making, like the London clay, found in all sections; *shell marl*, often in beds hard enough for building purposes, and that can be easily wrought; Tertiary *limestones* are frequent, and furnish a very good building material; the *ferruginous sandstones* are sometimes used. The materials for *concrete*, sand and pebbles, and shells for lime, are in all parts. The gray *granites*, at the head of tide, are among the best known. The *brownstone* is also on the border. These can be shipped directly from the quarries to all parts of this water-penetrated region.

Some bands of iron ore are found among the strata of the marls, &c., in various parts of Tidewater, some of them a foot thick. A specimen from Surry county yielded Professor Rogers 72.4 per cent. of peroxide.

The *architectural* minerals of the MIDDLE Country are the fine gray *granite*, found in its eastern border at the head of tide, at Richmond, Petersburg, Fredericksburg and elsewhere. This is of an even texture, easily wrought to a smooth surface, can be obtained in large slabs or blocks, is strong and durable, and has a pleasant tint. The trade in this fine building stone is increasing. It is being used in the construction of public buildings at Washington and elsewhere. The *brown-stone* of the Triassic is an esteemed building material, and is extensively used locally. Where that formation is crossed by the Midland railroad near Manassas, this rock is quarried and shipped to market. The *Potomac* or *brecciated marble*, found not far from Leesburg, is used for inside columns and ornamental work. A modified variety of this is found in Fauquier and other counties. *Greenish* and *bluish slates*, compact and separating into slabs suitable for building, are also found in this Triassic in Culpeper and elsewhere. In numerous localities, interstratified with the gneiss, are beds of soapstone, as in Amelia, valuable for hearths, furnaces, &c. *Clays* for brick are found in very many localities, and *kaolin* for fire bricks is often met with, as in Prince Edward, Cumberland, &c. Granite, stratified and unstratified, exists throughout the region. Gneiss, of a granitic character, laminated so that it is easily split into slabs, is found, as at the valuable quarries at Columbia on the James. A wide belt of this runs through the country. A *syenite*, found in Campbell county, is used for mill-stones, cut out in a single piece. *Asbestos*, used in making a fire-proof roofing, is found in Pittsylvania and elsewhere. *Roofing slate*, of the very best quality, is found in great abundance in Buckingham and other counties. Several companies are engaged in quarrying it. In the western border of this section, in Albemarle, &c., is a fine *slate* for mantels, hearth-stones, &c., being soft and easily cut. *Mica* is obtained in Hanover, Goochland, Louisa, &c., of a quality suitable for stove windows. A great variety and abundance of building materials are found everywhere.

The *agricultural minerals* of the Middle Country are the beds of *limestone*, disposed in lenticular masses along its western border, and the *epidotic* rocks, that extend through its whole territory. Both of these can be used to great advantage on the lands here.

The *ores and metals* of Middle Virginia are: *gold*, which is found in a belt some 15 or 25 miles in width, that runs for 200 miles through this section from Washington city to Halifax Courthouse. This is known as the "Gold Belt" of Virginia. It is composed of a series of granitic, syenitic, steatitic, chloritic and other rocks peculiar to this section, striking northeast and southwest with the belt, and dipping at high angles, or standing nearly vertical. Stratified with these are numerous veins of gold-bearing quartz, seams of magnetic, specular, hematite and other ores of iron, trap dykes, &c. The gold found in these materials varies in value from \$1.30 to \$1,000 to the ton; an average 100 tons, from the surface downward, is estimated as worth \$939.32.* Assays of samples from the Franklin mine, in Fauquier county, made

* Report of Richmond Chamber of Commerce for 1871. Article on "Gold Belt."

by R. D. Irving, of New York, in 1870, gave for 200 pounds of materials from the veins, as an average value, in one sample, \$46.40 of gold and \$1.48 of silver; in another, \$72.55 of gold and \$0.41 of silver, while another gave but \$2.32 of gold. The mean value of the assays of 10 samples was \$24.44 to the ton of 2,000 pounds. Large numbers of mines have been opened along the "belt," notably in Fauquier, Culpeper, Spotsylvania, Orange, Fluvanna and Buckingham counties, and from these and gatherings from the surface and soils, \$1,662,627 worth of gold had reached the U. S. Mint up to June 30th, 1871.* If the same skill and capital were employed here as in California, these mines, in the opinion of practical miners, would yield as well as those of that noted gold-producing State. *Silver* is associated with some of the gold-bearing rocks above named, especially the chloritic slate. *Copper* pyrites are abundant in all the "gold belt;" carbonate of copper is also found. The excellent character of the sulphurets of copper of this region is becoming known, and large quantities of this ore are now shipped from Tolersville in Louisa county. An analysis of a sample of the Tolersville pyrites, by Pattinson, of Newcastle-on-Tyne, England, gave—

Sulphur.....	43.00 per cent.
Copper.....	5.89 "
Silicious Matter.....	8.73 "
Moisture..	0.38 "

Another analysis, by Gibb, of Jarrow, gave—

Sulphur.....	48.25 per cent.
Copper.....	0.60 "
Silica	5.60 "

Plumbago, of good quality, occurs in Halifax, Amelia and other counties. *Iron* ores are found in great plenty, and the first successful furnaces in America were on the hematite beds of this section. In the "gold belt" are seams of *specular iron ore*, from 10 to 15 feet in thickness, extending with the belt. *Sulphuret of iron* is very plentiful in the same range, and extensive deposits of *brown hematite* ores are well known, both in the belt and along its eastern border. *Magnetic iron* ores are found in thick veins in many localities, as in Buckingham, Spotsylvania, &c. It may be stated as a general fact, that any section across the 200 miles of the length of Middle Virginia will embrace a dozen valuable seams of iron ore—including *limonites or hydrous peroxides, magnetites, chromates, sulphurets, micaceous, specular, &c.*, where the ores are abundant and can be easily mined. The introduction of cheap coal, now inaugurated, will bring these into use. Prof. Rogers gives the following analyses of ores here found:

LOCALITY.	COUNTY.	COMPOSITION IN 100 PARTS.					Per Cent. Metallic Iron.
		Peroxide of Iron.	Alumina.	Silica, &c.	Water.	Loss.	
1. Ross Furnace.....	Campbell.....	81.11	0.28	6.54	11.10	0.97	56.77
2. Stonewall Creek.....	Appomattox.....	76.00	0.50	13.00	10.00	0.50	53.20
5. Elk Creek.....	.....	84.00	0.85	7.60	7.10	0.45	58.80
4. Falling River.....	Campbell.....	84.20	0.56	4.50	10.00	0.74	58.94
6. New Canton.....	Buckingham.....	72.00	1.33	16.47	10.04	....	50.40
6. Chesterfield County.....	.....	85.15	4.00	4.20	6.50	....	....

* Merchants and Bankers Almanac, 1872.

Bituminous coal and *natural coke* are found in extensive beds in the Triassic or New Red Sandstone—especially in the “Richmond coal field” portion, where the coal-bearing rocks cover 150 square miles of surface. Over a million* tons were taken from this field in the 20 years, from 1822 to 1842. It has been longer known and worked than any other field in America, but never to the extent that the value of its coals would seem to justify.

† “In the part of this field upon the north side of James river five seams of coal have been opened, varying in thickness from two and a half to eight feet, giving an aggregate of more than 20 feet, as at Carbon Hill. On the south side of the river, at Midlothian, three seams have been opened, varying in thickness from 4 feet to 40, making from 50 to 60 feet of coal. One of the seams on the north side, from two and a half to six feet thick, is a natural coke (the coal having been coked by the intrusion of a trap dyke), known as carbonite; the other seams are coking coals, highly bituminous, as they should be, for they are young coals, and therefore fat, as the adage says, and admirably adapted to gas making. For this purpose the mines are extensively worked.

“Professor Hull, in the last edition of his work on the ‘Coal-Fields of Great Britain,’ says: ‘The Richmond coal-field contains several beds of valuable coal, one of which is from thirty to forty feet in thickness, highly bituminous, and equal to the best coal of Newcastle.’

“These mines are admirably located for commercial purposes, and the coals are highly commended by all that have used them.”

The analyses of these coals, by Prof. Rogers, give from 55.20 to 70.80 per cent. of carbon, from 22.83 to 38.60 of volatile matter, with from 2 to 22.60 per cent. of ash (most of the samples contain a small percentage of ash). A recent analysis‡ (1873) made in Glasgow, Scotland, gives the following results from seven analyses of samples from different seams and localities:

Volatile matter, 14.26 to 34.57 per cent.

Coke { Fixed Carbon, 56.23 to 81.61 per cent.
Sulphur, 0.04 to 1.10 per cent.
Ash, 2.24 to 8.88 per cent.

Water (at 212° Fahr.), 0.82 to 1.80 per cent.

Dry Coke, per ton of Coal, 12 cwt. 3 qrs. 13 lbs. to 16 cwt. 3 qrs. 10 lbs.

Coke, per cent., 64.33 to 84.18.

Sulphur in volatile matter, 1.14 to 0.78, or in all 0.18 to 1.83.

Heating power calculated, 8.35 to 11.04.

Specific gravity, 1.219 to 1.321.

Weight of a cubic foot, 77.6 to 82.3 pounds.

Weight per inch per acre, 123 to 133 tons.

The most important element in coals is the fixed carbon, and Dr. Wallace says: “In this respect the whole of the coals are of excellent quality, and are considerably superior to the average of the Newcastle coal, which, in many respects, they resemble.” The *Carbonite*, or natural coke, the same authority says, “is a material admi-

* R. C. Taylor—Statistics of Coal.

† Address of Maj. Jed. Hotchkiss before Society of Arts, London, 1873.

‡ Dr. William Wallace's.

rably adapted for stoves,* having a high heating power, and containing very little ash or sulphur." The census of 1870 reports 61,803 tons mined. Dana† says: "The coal is of good quality, and resembles the bituminous coal of the Carboniferous era;" and Macfarlane‡—"This oldest of our coal fields is yet to see its best days." And why should it not, when it has a capacity for an annual production of millions of tons, is but a few miles from tidewater, and can be water-borne to all the Atlantic cities. The Triassic coal has been partially opened in the field near Farmville; also, in the one near the North Carolina line. It is not likely that it is worth mining to any extent in the other Triassic beds—they are too shallow.

PIEDMONT has, for *architectural* purposes, an abundance, in all portions of it, of the best of *brick clay*; good *roofing* and heavier *slates* are found in Amherst and other localities; *soapstone* is found in Madison and elsewhere; *variegated marble* in Fauquier, and *kaolin* in numerous localities. The various *gneissoid* rocks, *greenstone*, &c., afford excellent and beautiful building stones.

For *agricultural* purposes this, like Middle Virginia, has the epidote rocks, the decay of which constantly renews its fertility.

The ores of Piedmont are very valuable; its beds of *magnetic iron ore* are numerous throughout its extent, notably in Nelson, Amherst, Albemarle, &c.

The quantity of magnetic ore, of the best quality, in this section, is very large, and now that coal is accessible, these most valuable ores must come into use, especially for mixing with other ores of iron. Prof. Rogers mentions the S. W. Mountain and Buffalo Ridge, its prolongation S. W., as containing deposits of this, with *micaceous iron ore*.

Recent§ operations in Amherst and Nelson counties, along James river and between it and Buffalo Ridge, have exposed some 25 parallel veins of iron ore, varying in width from 5 to 60 feet. The ores are the specular, magnetic, brown hematite, micaceous and manganiferous. The following analyses of these ores indicate fully their character:

Analysis of Magnetic and Specular Ores from Virginia, made by Prof. F. A. Genth, Dec., 1874.

	No. 1. Specular.	No. 3. Magnetic.	No. 5. Blue Magnetic.	No. 6. Specular.	No. 10. Magnetic.	No. 11. Magnetic.	No. 10. Magnetic.	No. 13. Specular.	No. 14. Brown Hematite.
Silicic Acid (Quartz).....	30.86	4.10	14.67	3.04	16.60	11.32	3.29	25.08	24.02
Titanic Acid.....	0.20	0.15	0.22	0.10	0.18	0.22	Trace	0.43	.....
Phosphoric Acid.....	0.37	0.02	0.08	0.11	0.54	0.70	0.08	0.55	0.93
Ferric Oxide.....	55.04	90.74	82.38	91.39	75.69	81.86	95.24	64.40	62.29
Manganic Oxide.....	0.17	0.11	0.32	0.17	0.29	0.20	0.09	0.27	0.19
Alumina.....	10.24	4.43	1.96	4.20	3.76	3.06	0.53	7.07	3.03
Magnesia.....	0.88	0.12	0.06	0.15	0.25	0.18	0.07	0.45	0.10
Lime.....	0.97	0.29	0.23	0.20	1.29	1.38	0.04	0.71	0.20
Water.....	1.27	0.04	0.18	0.54	1.40	1.08	0.66	1.04	9.24
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Metallic Iron.....	38.53	65.71	57.63	63.97	52.98	57.30	66.32	45.08	43.60
Phosphorus.....	0.16	0.009	0.035	0.048	0.237	0.307	0.035	0.24	0.41

* Meaning those of blast furnaces.

† Coal Regions of America—1873.

‡ Manual of Geology—1871.

§ Report of Iron Company.

The manganiferous ore here found was also analyzed by Prof. Genth, with the following results:

Silicic Acid.....	2.74
Phosphoric Acid.....	0.76
Binoxide of Manganese.....	66.91
Binoxide of Cobalt.....	0.79
Ferric Oxide.....	18.34
Alumina.....	1.50
Magnesia.....	0.40
Lime.....	0.93
Water.....	5.00
Baryta.....	2.63
	<hr/>
	100.00
Manganese.....	42.34
Phosphorus.....	0.33

A comparison of these analyses with those of the ores of Lake Superior and other portions of the United States, and with those of Europe, is very favorable to these ores, and shows that some of them, from their freedom from impurities, are especially adapted to the manufacture of Bessemer steel and the most valuable grades of iron. The best Lake Superior ores contain from 50.40 to 65.94 per cent. of metallic iron, 0.03 to 0.22 per cent. of phosphorus, and from 0.01 to 0.35 per cent. of sulphur. The magnetic ores of New York contain from 58.31 to 64.31 per cent. of metallic iron, from 0.022 to 0.723 per cent. of phosphorus, and from 0.002 to 1.502 per cent. of sulphur.

A test of the strength of pig iron recently made by the United States showed that the iron from No. 11 of above table resisted a pressure of 20,600 pounds to the square inch, while that of the Thomas Iron Company, of Pennsylvania, stood but 18,000, and that of the Cold Spring Furnace, of Hudson, New York, 17,000 pounds.

The President of the Virginia Midland Railway, Col. J. S. Barbour, in his report* to the State in 1874, mentions the opening of deposits of magnetic ore, for 30 miles along his railway, in Albemarle and Nelson counties. Some ore from Albemarle is "regarded as suitable for the manufacture of Bessemer pig iron." Deposits of ore have also been opened in Orange county, and a vein of specular ore, that has been traced for 30 miles through Culpeper, Orange and Albemarle, has been found to contain over "60 per cent. of metallic iron, and to be free from sulphur and phosphorus." This ore is of an excellent quality for making steel, and is so situated that it can be cheaply mined and transported to Pennsylvania and other Atlantic States, where it is needed to mix with local ores to produce the best results.

In Franklin county, Prof. Rogers mentions a bed of magnetic oxide from 4 to 6 feet thick, and another in Patrick from 3 to 6 feet wide—"a fine-grained, generally black ore." These ores yield from 70 to 72.4 per cent. of metallic iron, noted for purity and tenacity. *Specular, magnetic and hematite* and other iron ores exist in ex-

* Report of Virginia Board of Public Works for 1874, page 31.

tensive beds throughout Piedmont. Green *carbonate of copper* is found in small quantities in several counties, but little is known concerning it. *Lead* has been mined in Nelson county, the ore yielding some 52 per cent. of metallic lead and forty-five dollars worth of silver to the ton; lead is also found in Franklin and other counties. Brown oxide of *titanium* is known near Lynchburg. *Manganese* is extensively mined in Nelson county, and evidences of its existence in other localities are numerous.

The BLUE RIDGE has beautiful *greenstones* and some *granitic* rocks that answer for building stones, though, as a rule, these rocks are too soft or decay too readily, making good soil but poor walls; the reliance for the latter must be on the harder sandstones of the western slope. Where the greenstones are hard, nothing is prettier, or more agreeable in color for building purposes.

Mention has been made several times of the valuable properties of the *epidote* of this mountain range for enriching the soil. Prof. T. Sterry Hunt (formerly of the Geological Survey of Canada), in a recent article,* speaking of the southwestern portion of the Blue Ridge, says: "The traveler from New England, who expects ledges of rock, beds of sand and gravel, and huge boulders scattered over the land, the marks of what is called glacial action, is surprised to find nothing of all this here. *The hills to their very summits are covered not only with dense forests, but with a deep and strong soil*, which is, however, very unlike the layers of clay and loam with which he is familiar. *The rocks themselves, although of gneiss and mica slate, like that which prevails over so great a part of New England, have undergone a process of decay which has rendered them so soft that they may be readily cut by a spade or pick, although retaining all the veins and layers which marked their original stratification. Without having been broken or ground up, these hard rocks have moldered into a soft clayey mass, forming a soil 20 feet, and often much more, in depth, which from its peculiar structure has a natural drainage, and possesses, moreover, great fertility.*" These observations could be made in regard to nearly all the 300 miles of the length of this most fertile region.

The *ores* of the Blue Ridge are: *copper*, more or less, the whole length of the range, as *carbonates*, *sulphurets*, &c., chiefly in the latter form. In Floyd, Carroll and Grayson, a dozen mines were once opened and several thousand tons of ore, yielding from 6 to 30 per cent. of metal, were sent to market. Prof. T. S. Hunt, at the 1872 meeting of the American Science Congress, called attention to these Blue Ridge mines as sources from which abundant supplies of copper and sulphur could be obtained. Stating that England imports from Spain sulphurets of iron for sulphuric acid with which to treat the South Carolina phosphates, and we bring native sulphur from Sicily for the same purpose, "while the mountains of the Blue Ridge contain deposits of sulphur ore as abundant as those of Spain." England draws annually a half million tons of sulphurets from Spain, and 5 to 6,000 tons of Sicily sulphur are yearly used at Charleston, S. C.

In a letter to the Eng. and Mining Journal, of N. Y., Aug. 12th, 1873, Prof. Hunt states that he traced a belt of copper in Carroll county 7 miles N. E. and S. W.; it was from 20 to 200 feet wide—adding, "The supply of sulphur ores which

*In New York Tribune.

the region could be made to supply is enormous—only 17 miles, by good road, to near Meadows* Station.” Some of the ore yields 26 to 29 per cent. of copper.

The manufacture of alkalis, soda-ash, &c.—one of the most important of industries, but not found in the whole United States—is dependent upon such sulphurets. The salt, the coal, and the copper ores of Southwest Virginia, offer the finest field in the world for this industry. More than half the copper furnished to the world comes from the 6 to 8 per cent. ores of Chili. Space forbids more on this important subject.

Iron ores of great value are found in these same Blue Ridge counties. Prof. Rogers says of some iron ore in Grayson county, that it often yields, “by the usual smelting process, a metal having all the qualities of steel.” *Limonite* the yellow, *hematite* the red, and *magnetite* the black iron ores, are found in this region, though it has been poorly explored. Heavy strata of *specular iron ore*, many feet thick, are often found on the western flanks of this range, near the dividing line of the Azoic and Potsdam formations—it gives from 30 to 40 per cent. of iron, and is valuable for mixing with the richer ores near by.

The following analysis of specular ore from this range, in Augusta county, is by Prof. Mallett, of the University of Virginia:

Peroxide of iron	2.64
Sesquioxide of iron.....	51.33
Alumina	1.73
Magnesia	1.93
Silicic acid, as fine quartz.....	42.69
Trace of magnetite.	
Metallic iron.....	37.98

Among the foot-hills at the western base of the Blue Ridge, in the red shales of the Potsdam, or Formation I., often adjacent to the Valley limestone itself, is the remarkable deposit of *brown hematite* or *hydrated peroxide of iron*, that for nearly 300 miles offers its *great beds, of the best quality*, of this valuable ore to the manufacturer. This ore is often found in beds from 10 to 100 feet thick, and these, especially to the southwest, often extend unbroken for miles. The quantity and quality of this ore is a constant theme of remark in Prof. Rogers' Reports. These ores often yield, as the “run of the furnace,” some 60 per cent. of metallic iron, noted for its general excellence. The following analysis, by Booth and Garrett, in 1868, of ore from the Fox Mountain bank, of Hon. Wm. Milnes, Page county, shows the character of these ores:

Peroxide of iron	79.77
Oxide of manganese.....	Trace.
Silica.....	6.75
Alumina .....	.80
Magnesia .....	.05
Lime	None.
Sulphur .....	.17
Phosphoric acid.....	.13
Water	12.85
Metallic iron.....	55.84
Phosphorus.....	.06

*Max Meadows, Atlantic, Mississippi and Ohio Railroad, Wythe county.

The analysts state that this ore is noteworthy—(1), for its percentage of iron; (2), for the small amount of siliceous, with ample alumina to slag it off; (3), for the small percentage of sulphur and phosphorus; (4), for containing one-eighth water, making it more reducible in the bosh of the furnace; and from the proportion the small amount of sulphur and phosphorus bear to each other, they should neutralize the respective cold and hot short properties they impart to iron. They consider this adapted to making Bessemer steel. The furnace that used this ore, a common cold-blast charcoal one, from June 18 to Dec. 19, 1866, made 799 tons (2,240 lbs.) of pig iron, from 3,300,194 lbs. of ore, 367,500 lbs. of limestone, and 104,125 bushels of charcoal—a yield of over 54 per cent. of metallic iron. Fine beds of manganese are found in the Blue Ridge also.

The GREAT VALLEY has many varieties of *limestone*—magnesian, siliceous, flaggy, coralline, &c., for building purposes, and it is difficult to find better, all things considered; the best of lime, both common and hydraulic, is burned from them; there are also excellent *freestones*. *Clay*, for brick making, of good quality, abounds; and beds of *kaolin* are common near the foot of the Blue Ridge. Several varieties of *marble*, most of them dark or mottled, are often found.

The limestone gives a choice for almost any quality of lime for agricultural purposes; calcareous marls are plentiful in the beds of the smaller streams; the caves, which are numerous, are rich in nitrous earth.

Iron ores, brown hematites, are found in “pockets” in all portions of the Valley. These can supply large quantities of fine ores. *Umbel* exists in many places. In the mountain ranges that rise up in the Valley are very extensive beds of several varieties of iron ore. The Valley limestones make an excellent *flux* for iron; they are carried east for that purpose. *Lead** is found in many parts of this region. The mines in Wythe county have been worked since 1763, and some 25,000,000 pounds have been taken from them. The crude ore, sulphuret and carbonate generally, is found in veins in the limestone, and gives an average yield of 5 per cent. of metal, though some ores produce from 12 to 15 per cent. This metal could be mined here very extensively. *Zinc*, silicate and carbonate mostly, and sulphuret, abounds in the same locality in Wythe county. The ores are shipped to other States for smelting at present. Zinc is found co-extensive with the lead. *Fine sand* is abundant along the eastern side of the Valley. The large deposit of pure *kaolin* in Augusta has been used in the manufacture of “stone china” and “Rockingham” wares, and is now made into terra-cotta pipes and tiles, fire bricks, &c. *Barytes* are mined extensively in Smyth.

Beds of semi-anthracite or semi-bituminous coal are found all along the western side of the Valley throughout its whole extent. These are detached and broken fragments of what some call the *proto-carboniferous*, and others the false *coal-measures* (overlying the old red sandstone it is said), brought into these topographical relations by a great downthrow of the higher formations. These fragments are generally of small extent, yet they furnish two or more seams of good semi-anthracite coal, but so disturbed and crushed as to be of little value. In the New river basin is found, on the contrary, a very well developed coal-field of this era,

* Most of the lead is now (1875) made into shot at the mines.

containing, among others, two very accessible seams of good coal, varying in thickness from two to three and a half, and from six to nine feet. The better part of the field is thought to be the thirty miles of the length of it lying north of New river in Montgomery county; hence the whole is often spoken of as the Montgomery coal field, but very good openings have been made through 100 miles in length of a somewhat narrow belt along the west side of the Valley. These coals have only been used for domestic purposes, but the proximity of the great hematite iron deposits must soon lead to their trial for manufacturing purposes. The profitable area of this field may be roughly estimated at 100 square miles. Professor Rogers gives this analysis of the Montgomery county coal:

Carbon.....	80.20
Bitumen, &c.....	13.60
Ash.....	6.20

And adds: The combustible value or calorific power of 100 parts of this coal is equivalent to that of 92.5 parts of carbon.

A sample from Botetourt county gave:

Carbon.....	78.50
Bitumen.....	16.50
Ash.....	5.00
Calorific power.....	89.04

The Dora mines are in these measures in Augusta county.

The APPALACHIAN region has a great variety and abundance of excellent *building stones* in the numerous seams of limestone, sandstone, freestone, &c., extending through it. The beautiful variegated *brown marbles*, known as "Tennessee," are found in Scott county. In other localities *encrinal marbles*, having a great variety of colors, are found. The limestones are, many of them, easily wrought, and have a pleasant tint. The heavy, fine-grained sandstones are highly esteemed for the construction of furnaces. *Brick clay* is found in all the limestone valleys, and *fire clay* in connection with the extensive ranges of iron ore deposits.

The limestones of this region are of the best character for burning into *agricultural lime*. Marls are found along the streams of the numerous limestone valleys; and in the caves and fissures of the limestone ridges *nitrous earths* are abundant.

This Appalachian Country includes the great "*iron belt*" of Virginia, in which are found vast quantities of the *red* and *brown* iron ores, *limonites*, *hematites*, and some that resemble *magnetites*, spoken of as *red* or *brown hematites*, *fossil ore*, *red shale ore*, *dyestone ore*, &c. Professor Rogers says: "Of the twelve rocks, each marked by certain distinctive characters, composing the mountains and valleys of this region, it has been determined that at least *eight are accompanied by beds of iron ore*. Each ore has distinctive marks by which it may be recognized, and peculiarities of composition, fitting it for certain uses to which others would be less happily adapted. Thus, in the quantity and variety of this material in all its valuable forms, our State is now proved to have no rival." * * Again, speaking of smelting iron with *raw coals*, (now, 1873, being done)—"Should these improvements be brought into extensive operation, as in process of time they most assuredly will, the prosperity of this vast and almost forgotten portion of the State will outstrip anything that the imagination of its present inhabitants can conceive." * Speaking† of For-

* Report of 1836.

† Report of 1837.

mation No. VII.: "Indeed this part of it, throughout a large portion of the Appalachian region, is the repository of *continuous beds of iron ore of immense extent*, which often replace the sandstone for a great depth." In the first ranges of the mountains west of the Valley, called by various names, Little North Mountain, &c., but as a range known as the Kitatinny, on their eastern and western slopes are found solid masses of *brown hematite iron ore*, presenting the appearance of a thick stratum between the sandstone and limestone rocks that form the mountains and dip, generally, at a considerable angle. *These ores extend to unknown depths between these rocks, and often stand out as huge bluffs, along the sides of the ridges, from 10 to 50 feet high.* As the same formation is repeated in a number of successive ranges of mountains, so, also, is the deposit of this ore. The following analyses, by O. J. Heinrich, of two samples from the largest bluff deposits, at Elizabeth Furnace, in Augusta county, show the general character of these ores:

Water.....	10.33	14.656
Peroxide of iron.....	73.33	83.310
Oxide of alumina.....	2.00	.500
Oxide of lime.....	1.00	.....
Oxide of magnesia.....	.30	.066
Silicic acid.....	12.20	1.466
Carbonic acid.....	.83	.....
Loss.....	.01	.002
	<hr/> 100.00	<hr/> 100.000
Metallic iron.....	51.33	58.32

Analyses by Britton, of hematite ores from Callie Furnace, near Clifton Forge, Alleghany county, give a yield of 58.60 per cent. of metallic iron.

The *manganese* found in some of these ores gives them a special value for use in the manufacture of Bessemer steel.

In the same ranges of mountains the poorer, but, for many purposes, not less valuable, *red shale* ores are found; their seams are not as thick, but they are very abundant.

The *Fossil-ore* of Formation V.—the Clinton ore of New York and the *Paint or Dyestone* ore of Tennessee—is notably developed in the southwestern portion of this region, where it runs for a hundred miles or more in persistent strata, some of them from two to five feet in thickness; these ores are generally found in low ridges. At Cumberland Gap the Dyestone seam, in Poor Valley Ridge, a low range in Virginia, parallel to the Cumberland Mountain, is from 24 to 30* inches thick, regularly stratified and quarried in blocks. Prof. Rogers gives this analysis† of the ore at Cumberland Gap:

Peroxide of iron.....	76.60
Alumina.....	7.60
Carbonate of lime.....	1.00
Water.....	3.00
Silica and insoluble matter.....	11.30
Loss.....	0.60
	<hr/> 100.00

Metallic iron..... 53.55 per cent.

It also contained traces of oxide of manganese and of magnesia.

* Safford—Geology of Tennessee.

† Report of 1840.

This* ore, when *pure*, can yield 70 per cent. of metallic iron. As the formation in which this ore is found is repeated in many parallel ridges, so, in like manner, the beds of ore are multiplied. This ore, in the southwest of Appalachia, has the advantage of being within 8 or 10 miles, sometimes nearer, of the eastern edge of the great Appalachian coal field, as in Lee, Scott, Russell and Tazewell counties.

It is difficult to find another belt of country, 300 miles long and averaging 15 miles in width, that is as well supplied with immense deposits of numerous kinds of the ores of this most valuable metal as this *Appalachian iron belt* of Virginia.

Gypsum, or *plaster* (sulphate of lime), is found in beds that have been opened for more than twenty miles along the North Fork of Holston river, in Washington and Smyth counties. In some places shafts have been sunk in the plaster for 500 feet without going through it. The width of the deposit is unknown—often over 50 yards—giving a quantity of this most valuable specific manure almost beyond calculation. An analysis of two specimens, made at the Virginia Military Institute gave 78.86 and 76.81 per cent. of sulphate of lime in this plaster; *pure* sulphate would contain 79.07, showing the excellent quality of the Holston plaster. This plaster is sold at the mines at \$2.50† per ton; it reaches market by the railroad from Saltville. "Its‡ virtues are well known and highly prized. It *doubles* the grass crop and grain, and greatly improves corn. One bushel of 100 pounds is sown to the acre."

Salt is found in the same region with the plaster, at Saltville, on the North Fork of Holston; brine is drawn from Artesian wells about 200 feet deep, the water rising to within 40 feet of the surface. This brine comes from a *solid bed of rock salt*, 200 feet below the level of the Holston, and borings have been made into it 176 feet without passing through it. The supply of brine is not affected by any operations yet carried on, and at one time, during the Confederate war, 10,000 bushels of salt were made there each day for some six months. The present yield is about 360,000‡ bushels a year, using wood for fuel. When improvements contemplated bring the coal, that is but 40 miles off, to these works, there will be a very large amount of salt made here, as it has the advantage by being so far inland. The copper ores of Floyd, before mentioned, make it possible to here locate, successfully, alkali works.

Professor Lesley, in the report before referred to, mentions the fact that a salt well has been bored in Tazewell county, and adds: "It must be borne in mind that the salt wells of Eastern Kentucky get their water from the conglomerate at the base of the Coal Measures. There must, therefore, be a salt water bearing formation several hundred feet below the coal bed at the bottom of this well."

Salt has been made at works in the southeastern part of Lee county, on the waters of Clinch river. There is, no doubt, an abundance of brine throughout this region in the formation above named.

* Safford—Geology of Tennessee

† Prof. Lesley—1871—Report on this Region to Am. Phil. Soc.

‡ Lesley—1871.

The following table, from the Report of the Superintendent of the New York Salt Works, at Syracuse, for 1854, gives the character of the Saltville salt, compared with that from other localities :

		Chloride of Sodium.	Sulphate of Lime.	Sulphate of Magnesia.	Chloride of Calcium.	Chloride of Magnesium.	Oxide of Iron.	Water.
BRINE.	Saltville	98.39	1.22	0.39	.....	.....	Trace.	.....
	Syracuse, N. Y.	95.86	2.54	.....	0.90	0.69	0.004	.....
	Kanawha, W. Va.	79.45	.....	.....	1.52	0.85	Trace.	.....
	Cheshire, Eng.	98.07	1.57	.....	0.13	0.23	.....	.....
MANUFACTURED SALT.	Saltville.....	91.18	0.27	0.05	.....	.....	.....	0.40
	Syracuse.....	97.95	0.04	.....	0.04	0.03	.....	1.94
	Kanawha.....	91.31	.....	.....	1.26	0.43	.....	7.00
	Cheshire.....	98.53	1.26	.....	Trace.	0.01	.....	0.20
	Turk's Island.	96.76	1.56	0.64	.....	0.14	.....	0.90

Barytes, *lead* and some other minerals are found in a number of localities.

Bituminous coal is found in the counties of Tazewell, Russell, Scott, Lee, Buchanan and Wise, in the southwest, where a portion of the Great Appalachian coal field of the United States crosses Virginia territory, giving it nearly 1,000 square miles of this remarkable deposit of fossil fuel. Nowhere else in the Union do we find the same condition of things as that existing here, where "the limestones of the Lower Silurian, holding the brown hematite ores, directly abut against the coal beds of the carboniferous and sub-carboniferous era"—the result of great upheavals and downthrows, that have brought the richest farming and grazing lands and the most valuable ores of iron alongside the coals, *without an intervening mountain barrier*. The line of the fissure, where these formations meet, is in the valley of the Clinch river, so that the branches of that stream from the west flow from the coal measures * "for about 70 miles along the valley of the Clinch; any railroad descending the Clinch, from Jeffersonville to the mouth of Guest's river, in Wise county, may have as many *collieries* alongside of it as it pleases. Short streams, from five to eight miles long, flow into the Clinch from the north, *cutting the coal beds at water level*. There are thirteen or fourteen of these streams on which to establish collieries, and up which to turn in branch coal roads, from half a mile to three miles long, with ascending gradients of twenty to thirty feet in the mile. In one case a six and a half foot coal bed underlies the river bottom flats at a depth of 300 feet. The coal beds thus open * * are the *lower coals of the carboniferous system*, occupying the position of the coal beds at Cresson on the Pennsylvania railroad, at Blossburg and Towanda in northern Pennsylvania, and at Kittaning and Brady's Bend on the Alleghany river. They

* Lesley—Report on Region. Prof. L. is high authority on coal and iron.

yield a highly bituminous coal, deposited in benches of different constitution and value, some of which furnish a fuel pure enough to be coked and used for smelting iron ore." Prof. Lesley also says: "On Crab Orchard creek is a fine six-foot bed of rather handsome flaming coal, solid enough to wagon over rough roads, and not making much ashes or clinker in the grate. It is at least equal to the general run of the Lower Coal Measure coals in the Bituminous Coal Basins of the Susquehanna West Branch and the Conemaugh." Again of the 6-foot seam in Wise county: "At one place, where the bed has been dug a little into, it yields the best kind of bituminous coal, fat and caking, but friable, with no appearance of sulphur and making no clinker. It is good blacksmith coal, and no doubt will make good coke. A piece of ill-made coke from what is, perhaps, the same bed, near Gladesville, shows that the best coke can be got from it." There are four or five good seams of coal, well known in the Lower Measures—these are all accessible along the east border of this field. Going northwestwardly, through Buchanan and Wise, the section would cross the *Lower* Coal Measures and enter the *Middle* series, which is so well developed where cut through by New river and its continuation—the Great Kanawha in West Virginia. This series, with its 30 to 50 feet of workable thickness of *gas*, *shop*, *splint*, *cannel*, and other varieties of coal, will, no doubt, be found as complete in Virginia territory as it has been in the adjacent portions of Kentucky and West Virginia. So Virginia has a most valuable bituminous coal field, favorably situated, and that can yield her millions of tons of the best of these coals.

The mineral resources of the State may be summed up as consisting—

IN *TIDEWATER*—of several kinds of marls, greensand, &c., highly esteemed as fertilizers; of choice clays, sands and shell-limestones, for building purposes.

IN *MIDDLE*—of fine granites, gneiss, brownstone, sandstone, brick-clays, fire-clays, soapstones, marble, slates, &c., for building materials; epidote in various forms and limestone for fertilizing uses; gold, silver, copper; specular, magnetic, hematite and other ores of iron in abundance; bituminous coal, &c.

IN *PIEDMONT*—granitic building stones, marbles, sandstones, brick and fire clays; epidotic rocks and limestone, for improving the soil; magnetic, hematite and other ores of iron; barytes, lead, manganese, &c.

IN *THE BLUE RIDGE*—various and abundant ores of copper; immense deposits of specular and brown hematite and other iron ores; greenstone rocks, rich in all the elements of fertility; sandstones and freestones; glass sand and manganese; brick and fire-clays.

IN *THE VALLEY*—limestones of all kinds, for building and agricultural uses; marbles, slates, freestones and sandstones; brick and fire-clays, kaolin, barytes; hematite iron ores, lead and zinc in abundance; semi-anthracite coal, travertine marls, &c.

IN *APPALACHIA*—limestones, marbles, sand and freestones; slates, calcareous marls, brick clays, &c.; various deposits of red, brown and other ores of iron, plaster, salt, &c., and a large area of all varieties of bituminous coal.

In conclusion, it may truthfully be stated, that in the *abundance and variety* of building stones and mineral building materials; of fertilizing minerals; of the ores of the most useful metals and of mineral fuel, Virginia occupies the front rank.

Virginia is so situated in respect to the Great Appalachian Coal Field that fronts

her entire western border, in West Virginia, as to command all the advantages of cheap fuel of excellent quality, offered by that vast deposit of bituminous coal; her railways and canals can place it beside her ores at prices that will enable the manufacturer to defy competition in the production of iron. The geological map presents this fact very forcibly.

CHAPTER III.

THE CLIMATE OF VIRGINIA.

Man is so dependent, in all the essentials of his existence, upon the climatic conditions of the country he inhabits, a knowledge of the phenomena of climate is of the utmost importance. The length and safety of a voyage to or from any country; the cultivation of crops, not only in the questions of seed-time and harvest, but also the selection of kinds; the returns that may be looked for in the agricultural operations of a series of years; the conditions of health; the precautions necessary to guard against sickness and the destruction of the fruits of industry—all these, and many other things that affect human comfort and happiness, depend on the character of the meteorology of the region inhabited.

Virginia, as a whole, lies in the region of "middle latitudes," between $36^{\circ} 30'$ and $39^{\circ} 30'$ north, giving it a climate of "*means*" between the extremes of heat and cold incident to States south and north of it.

If Virginia were a plain, the general character of the climate of the whole State would be much the same; but the "*relief*" of its surface varies from that of some of its large peninsulas not more than 10 or 15 feet above the sea-level, to that of large valleys more than 2,000 feet above that level. Long ranges of mountains, from 3,000 to 4,000 feet in height, run entirely across the State, and the waters flow to all points of the compass. So diversified are the features of the surface of the State, within its borders may be found all possible exposures to the sun and general atmospheric movements. It follows, from these circumstances, that here must be found great variety of temperature, winds, moisture, rain and snow-fall, beginning and ending of seasons, and all the periodical phenomena of vegetable and animal life depending on "the weather."

The winds are the great agents nature employs to equalize and distribute temperature, moisture, &c. Virginia lies on the eastern side of the American Continent, and on the western shore of the Atlantic ocean; it extends to and embraces many of the ranges of the Appalachian system of mountains that run parallel to that ocean shore; therefore it is subject not only to the *general movement* of winds, storms, &c., *from west to east*, peculiar to the region of the United States, but to modifications of that movement by the great mountain ranges; it is also subject to the great atmospheric movements *from the Atlantic* that, with a rotary motion, come up from the tropics and move along the coast, extending their influence over the Tidewater and Middle regions of the State, *sometimes* across Piedmont to the foot of the Blue Ridge,

but rarely ever over or beyond that range; it has also *surface winds*, usually from the southwest, that follow the trend of the mountains, and bring to them and their enclosed parallel valleys the warmth and moisture of the Gulf that clothes them all with an abundant vegetation.

The same causes that produced the magnificent forests of the Carboniferous Era, and furnished the materials for the vast deposits of coal in the 60,000 square miles of the great Appalachian Coal Field that flanks Virginia on the west, still operate and clothe the surface of the same region with an abundant vegetation. The laws of the winds make one region fertile and another barren. America owes its distinction as the Forest Continent* to the situation of its land masses in reference to the prevailing winds.

TEMPERATURE is the fundamental phenomenon of climate. †“The distribution of heat is the controlling influence of all climates.” “The knowledge of the extremes of heat and cold at any one point, in any one year, is of the greatest importance. An extremely hot week, or even a hot day, has a very marked effect on human life; an extremely cold day or week is equally destructive.”

In the State of New Jersey‡ it has been noted that the difference of 3 or 4 degrees of *mean spring temperature* found between the northern and southern portions of that State, makes a difference of from 10 to 14 days in the ripening of strawberries; and a similar difference of *mean summer temperature* enables the farmer, in the southern part of the same State, to grow profitably and successfully sweet potatoes, melons and other sub-tropical products that will not ripen in the northern part.

§ The following table presents the *maximum*, the *minimum*, and the *mean*, for each month of two years, from the Spring of 1869 inclusive, to that of 1871, for ten stations, in different divisions of the State, grouped in *seasons*, with the *means* for the seasons and the years. The stations are selected so that, as far as possible, they may be representative ones for each section of the State. No observations are recorded from the Blue Ridge or from Appalachia, consequently we have no stations there. These *highest* and *lowest* indications of the thermometer (Fahrenheit's), show the extremes of the temperature, but the *means* of the seasons furnish the data for arriving at conclusions as to the adaptability of the climate for different productions, &c. The observations were made at 7 A. M., 2 and 9 P. M. of each day.

* Guyot.

† Statistical Atlas of the United States.

‡ Geology of New Jersey, 1868.

§ The meteorological tables of the Smithsonian Institution are the authority in preparing this article. The world is largely indebted to Prof. Henry for contributions to the meteorological science of the country; his labors have made possible the valuable “Probabilities” of the weather of the United States Signal Service, the “certainties” of which are so highly valued by all.

TABLE I.

Maximum, Minimum and Mean Temperature of Virginia, by Seasons.

TIMES	TIDEWATER.						MIDDLE.			PIEDMONT.						VALLEY.														
	JOHNSONTOWN.			HAMPTON.			BACON'S CASTLE.			COMORH.			VIENNA.			PIEDMONT S.N.			LYNCHBURG.			STAUNTON.			LEXINGTON.			WYTHEVILLE.		
	Maximum.	Minimum.	Mean.	Maximum.	Minimum.	Mean.	Maximum.	Minimum.	Mean.	Maximum.	Minimum.	Mean.	Maximum.	Minimum.	Mean.	Maximum.	Minimum.	Mean.	Maximum.	Minimum.	Mean.	Maximum.	Minimum.	Mean.	Maximum.	Minimum.	Mean.	Maximum.	Minimum.	
SPRING.	67	18	43.2	68	18	44.0	75	19	46.9	73	17	45.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	80	35	54.1	86	33	56.1	91	36	53.6	87	32	56.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	87	47	56.8	96	47	63.8	96	47	65.8	92	43	62.6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
SUMMER.	...	...	51.4	...	...	54.6	...	...	57.1	...	...	53.8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	91	57	73.8	94	60	76.8	100	60	79.8	96	52	73.9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	94	64	76.9	99	65	80.0	104	66	82.9	101	62	79.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
AUTUMN.	95	59	75.2	98	62	77.5	100	64	81.0	104	56	78.4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	...	...	75.3	...	...	78.1	...	...	81.2	...	...	76.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	90	50	69.6	92	46	70.5	*90	44	69.2	86	53	70.2	86	42	68.8	82	45	66.5	82	44	64.1	90	41	67.4	82	36	61.5	...	...	...
WINTER.	82	36	54.8	78	34	55.2	80	33	54.6	77	33	52.6	77	34	52.3	69	33	53.7	69	30	48.1	78	31	52.3	68	25	47.1	...	...	...
	64	27	43.4	64	27	43.5	66	26	42.1	65	28	41.7	66	27	41.2	62	22	38.5	61	29	43.4	63	28	40.2	70	20	40.8	65	18	36.3
	...	...	55.9	...	...	56.4	...	...	55.3	...	...	54.8	...	...	54.1	...	...	54.5	...	...	50.8	...	...	...	...	...	...	...	...	...
MEANS.	60	23	43.4	61	24	42.5	63	24	44.4	68	23	39.8	57	25	38.5	64	18	35.8	58	27	41.2	56	21	37.4	60	16	39.1	53	13	34.0
	66	23	45.7	70	22	45.8	71	22	47.1	72	16	42.5	69	14	41.0	70	10	36.1	66	18	44.8	66	18	41.5	74	13	43.0	60	6	37.3
	60	17	39.7	65	16	41.5	68	18	42.2	60	14	37.1	55	8	36.0	56	1	30.7	55	17	40.4	57	11	36.1	70	0	40.0	54	5	34.7
MEANS.	...	...	42.9	...	...	43.3	...	...	44.6	...	...	39.8	...	...	38.5	...	...	34.2	...	...	38.3	...	...	...	...	...	...	...	...	...

SPRING.	{ Mar.	61	28	43.5	66	28	43.3	64	26	44.1	64	27	42.2	67	23	40.3	67	18	32.2	64	30	44.2	60	19	39.1	71	19	43.1	60	10	37.3
		78	36	52.9	84	38	55.1	84	40	56.6	83	35	55.3	86	36	54.8	91	32	52.4	82	39	55.9	80	34	52.7	86	38	55.7	80	36	52.5
	{ April.	81	52	63.7	90	52	66.0	88	48	67.2	82	52	65.5	86	48	67.6	85	42	63.4	83	48	66.6	81	49	62.7	91	48	66.1	84	40	61.5
		Means .....	.....	53.4	.....	.....	54.8	.....	56.0	.....	.....	.....	54.3	.....	.....	54.2	.....	.....	51.7	.....	.....	55.6	.....	.....	51.5	.....	.....	55.0	.....	.....	50.4
SUMMER.	{ June.	94	58	74.6	98	64	76.5	98	64	78.5	92	64	76.0	91	60	73.6	94	58	72.9	90	58	73.4	89	56	71.8	99	58	74.5	86	56	68.0
		94	67	79.5	100	67	81.4	98	72	83.1	94	66	79.7	93	63	77.4	95	62	76.6	91	66	78.5	89	64	75.1	99	66	79.5	86	57	74.1
	{ July.	95	64	77.7	98	64	79.0	100†	65	81.9	90	64	78.2	90	57	75.1	93	60	74.7	90	64	76.3	87	61	72.4	98	60	77.2	84	62	72.3
		Means .....	.....	77.3	.....	.....	79.0	.....	81.2	.....	.....	.....	78.0	.....	.....	75.4	.....	.....	74.7	.....	.....	76.1	.....	.....	73.1	.....	.....	77.1	.....	.....	71.4
AUTUMN.	{ Sept.	85	56	71.0	86	56	71.7	91	53	73.1	86	54	71.3	78	58	69.7	86	50	66.9	82	53	69.8	78	47	64.3	85	50	66.8	80	45	64.2
		80	42	61.9	83	45	62.3	90	39	63.2	82	47	62.7	71	43	57.0	78	34	56.0	76	44	60.5	73	39	55.0	78	34	54.8	71	34	54.3
	{ Oct.	76	28	50.0	72	25	49.9	78	20	49.4	71	31	48.2	69	32	46.8	69	20	41.8	68	31	49.2	66	29	44.9	66	18	41.3	66	20	41.9
		Means .....	.....	61.0	.....	.....	61.3	.....	61.9	.....	.....	.....	60.7	.....	.....	57.8	.....	.....	54.9	.....	.....	53.8	.....	.....	54.7	.....	.....	54.3	.....	.....	53.5
WINTER.	{ Dec.	66	9	38.7	65	6	38.7	71	—4	38.2	61	6	32.9	59	8	34.8	64	2	32.3	62	9	38.1	60	5	32.3	65	—2	31.2	60	—4	31.4
		64	18	38.2	64	18	38.6	.....	.....	.....	66	14	35.3	65	12	37.3	69	8	32.4	62	20	40.4	60	21	35.7	.....	.....	.....	62	17	35.7
	{ Jan.—1871.	74	16	41.8	78	16	44.3	74	12	44.4	66	13	38.3	69	12	37.5	70	6	36.0	63	20	42.9	69	10	39.2	64	—3	37.5	60	14	40.5
		Means .....	.....	39.6	.....	.....	40.5	.....	.....	.....	.....	.....	36.5	.....	.....	36.5	.....	.....	33.6	.....	.....	40.5	.....	.....	35.7	.....	.....	.....	.....	.....	35.9
YEARLY MEANS.	{ 1869-'70	.....	.....	56.4	.....	.....	58.1	.....	59.5	.....	.....	.....	56.3	.....	.....	.....	.....	.....	.....	.....	.....	56.7	.....	.....	53.6	.....	.....	56.5	.....	.....	51.7
		.....	.....	57.8	.....	.....	58.9	.....	.....	.....	.....	.....	57.4	.....	.....	55.9	.....	.....	53.7	.....	.....	58.0	.....	.....	53.7	.....	.....	.....	.....	.....	52.8

* Zuni substituted—Bacon's Castle wanting.

† Surry Courthouse substituted for rest of table.

‡ Near Wytheville for March.

The Tidewater stations are, probably, none of them as much as 100* feet above the sea. JOHNSONTOWN is in Northampton county, on the "Eastern Shore" peninsula, and gives the conditions for that almost insular region, where the influence of the ocean is most felt in preserving a mean temperature and equalizing the seasons. The *extremes* and *average* temperature are decidedly less than at the other stations—even much less than at Hampton, on the opposite side of the Bay, but more inland. HAMPTON, in Elizabeth City county, is open to the sea on one side only; it gives the type of climate for the interior or bay-coast line; its *extremes* and *means* are greater than those of Johnstown. BACON'S CASTLE in Surry and ZUNI in Isle of Wight county, stations not far apart, give the representative climate for the midland of Tidewater, especially for the Southside peninsula, where the season temperatures are greater than in any other portions of the State, making this the cotton belt. COMORN, in King George county, is still farther from the sea; it represents the western portion of the Tidewater plain, as Hampton does the eastern: and, of course, has greater *extremes* and lower *means*. Taking the averages for the year 1869-'70 at these Tidewater stations; that is—

Johnstown.....	56°.4
Hampton.....	58 .1
Bacon's Castle, &c.....	59 .5
Comorn.....	56 .3
Average.....	57°.6

We have 57°.6 as the mean temperature of that year. VIENNA, in Fairfax county, compared with Comorn, shows how small the differences of temperature are between western Tidewater and eastern Middle Virginia; Vienna is probably some 350 to 400 feet higher than Comorn above the sea, and, by the rule that each 333 feet of difference in elevation diminishes the temperature one degree for the higher place, we find that Vienna has, generally, this element lower than Comorn. LYNCHBURG, in Campbell county, though grouped in Piedmont, is the representative of the higher western portion of the Middle country, as it is 575 feet above tide; it is far inland, and its *means* are higher than those of Vienna. PIEDMONT STATION, in Fauquier county, some 650 or 700 feet above the sea, shows the temperature of northeastern Piedmont; its lower season *means* indicate the more elevated country and the proximity of the mountains. STAUNTON is 1,400 feet above the sea, in a valley bounded on each side by high mountain ranges, the western the higher, and the *means* and *extremes* of its temperature are those peculiar to the central portions of the Great Valley; the spring and summer *means* approximate, remarkably, those of Johnstown by the seashore; those of autumn differ more, but they are more alike again in winter. LEXINGTON is not as elevated as Staunton; it represents the depressed portion of the Valley near the "troughs" of the rivers and the water-gaps of the Blue Ridge; its *means* are greater than those of Staunton, but it offers the same resemblances. WYTHEVILLE is 2,300 feet above the sea, and fairly typifies the elevated southwest of the Valley and Appalachia; its summer temperature is lower than that of the other meteorological stations, so are also its yearly means—results due not only to

*The elevations given are those of the stations of observations, as near as can be ascertained.

its elevation, but also to its interior location and the lofty character of the enclosing mountain ranges.

In the following table the Season Means of Table I. are brought together:

TABLE II.—Mean Temperatures of Virginia for Two Years, by Seasons.

	TIDEWATER.				MID.	MID. & PIED.		VALLEY.		
	Johnsontown.	Hampton.	Bacon's Castle.	Comorn.	Vienna.	Lynchburg.	Piedmont S'n.	Staunton.	Lexington.	Wytheville.
1869-'70.—Spring	51.4	54.6	57.1	53.8	.....	54.3	.....	51.0	54.8	51.7
Summer	75.3	78.1	81.2	76.7	.....	76.1	.....	74.3	77.1	71.5
Autumn	55.9	56.4	55.3	54.8	54.1	54.5	.....	50.8	53.5	48.3
Winter... ..	42.9	43.3	44.6	39.8	38.5	42.1	34.2	38.3	40.7	35.3
Yearly Means.....	56.4	58.1	59.5	56.3	.....	56.7	.....	53.6	56.5	51.7
1870-'71.—Spring	53.4	54.8	56.0	54.3	54.2	55.6	51.7	51.5	55.0	50.4
Summer	77.3	79.0	81.2	78.0	75.4	76.1	74.7	73.1	77.1	71.4
Autumn	61.0	61.3	61.9	60.7	57.8	59.8	54.9	54.7	54.3	53.5
Winter	39.6	40.5	.....	36.5	36.5	40.5	33.6	35.7	.....	35.9
Yearly Means.....	57.8	58.9	.....	57.4	55.9	58.0	53.7	53.7	.....	55.8

The mean temperature of the State, deduced from the above, was 56°.1 in 1869-'70, and 56° in 1870-'71.

The years 1869-'70 were selected for these tables, because they include the year for which and that in which the census of 1870 was taken, and the results of that census are used for various purposes in these pages. The census was taken June 1st, 1870—therefore its "crop" returns must be for the season of 1869.

Guyot, in the "Map Showing the Distribution of the Temperature of the Air and the Course of the Annual Isothermal Lines," in his recently issued Physical Geography, locates Virginia between the curves of 50° and 60° of mean annual temperature (the result reached by the tables already given), the belt that includes Cincinnati, St. Louis and San Francisco in the United States, the south of England and Ireland, the whole of France, the most of Portugal, Spain and Italy, the valley of the Danube, including Vienna, Constantinople and most of Turkey, in Europe; Pekin and the Hoangho Valley in China, and the island of Yeddo in Japan, in Asia.

The Statistical Atlas of the United States, published by the authority of Congress, has a Temperature Chart, Plate VII., "Showing the distribution by Isothermal Lines of the Mean Temperature for the year," constructed under the direction

of Professor Henry, of the Smithsonian Institution, one of the ablest living meteorologists.

This chart shows that the *isotherm*, or mean annual temperature line of 60° , runs through Eastville on the Eastern Shore, and then southwest by Hicksford to Montgomery in Alabama. All the region to the southeast of this line in Virginia has a mean annual temperature between 60° and 64° . This is the cotton producing zone; it includes nearly half of North and South Carolina, much of Georgia, &c.

The line of 56° enters the United States through the mouth of Delaware bay, runs by a south curving line west to and through Washington, then southwest between Middle and Piedmont Virginia, passing west of Danville, on to Atlanta in Georgia. All the country between this line of 56° and that of 60° , before described, is the belt of 56° to 60° of mean annual temperature. In this zone tobacco is a prominent staple.

The isothermal curve of 52° enters the United States about midway of New Jersey, south of the latitude of New York, then runs west by Trenton to the Cumberland Valley of Pennsylvania, then curving southward through Cumberland in Maryland and Staunton in the Shenandoah Valley, crossing the Blue Ridge in Augusta county, it passes along the eastern foot of the Blue Ridge into Georgia, where it curves to the northwest, and returns and runs along the eastern side of the Great Central Valley in Tennessee; continuing northeast, its course is along the western side of the Great Valley of Virginia to the vicinity of the James, where it bears more to the west and runs north to the Potomac near New Creek in Maryland, whence by boldly curved lines it extends westward through the central portions of Ohio, Indiana, Illinois, &c. So the zone of mean temperature of from 52° to 56° embraces all of Piedmont, the less elevated portions of the Valley and much of Appalachia—especially the southwestern portion of it. It includes much of the grass and small grain country.

A narrow belt of the elevated portions of the State is in the zone of 48° to 52° —the one that includes East Massachusetts, all of Rhode Island and Connecticut, much of New York, New Jersey, Pennsylvania, Ohio, &c. It is the grazing region especially.

The scale of this map is so small, its delineations can only be accepted for general results; these would locate—

Tidewater in the zones of 60° to 64° and 56° to 60° ;

Middle in the zones of 56° to 60° and 52° to 56° ;

Piedmont in the zone of 52° to 56° ;

The Valley in the zones of 52° to 56° and 48° to 52° ; and

Appalachia in the zones of 48° to 52° and 52° to 56° .

All these facts present the temperature of Virginia in a most favorable light, and show its perfect adaptedness to the growth of the productions of both the cool and the warm-temperate climates of the earth—it has the *medium means*.

The *average temperatures of January and July*—the representative months of winter and summer—are often taken as guides for determining the character of the temperature of any given locality. The following table gives these averages for a number of places in all parts of the historic world, compared with those of the selected stations in Virginia, furnishing the data for selecting a situation for any specified *mean* of this most important climatic element:

TABLE III.—Average Winter and Summer Temperature of Places, as Determined by the Averages of January and July.

IN VIRGINIA.—1870.	JAN.	JULY.	IN UNITED STATES.	JAN.	JULY.	IN EUROPE.	JAN.	JULY.	IN ASIA, AUSTRALIA.	JAN.	JULY.
Johnsontown	45°	79°	Oregon City.....	40°	72°	Edinburg.....	36°	58°	Smyrna	53°	82°
Hampton.....	45	81	San Francisco.....	50	58	Dublin.....	38	61	Jerusalem.....	43	77
Bacon's Castle.....	47	83	Salt Lake City.....	27	81	London.....	37	65	Delhi.....	54	84
Comorn	42	79	St. Paul, Minn.....	14	73	Paris	38	66	Calcutta.....	69	85
Vienna	41	77	St. Louis.....	33	77	Madrid.....	45	76	Canton.....	52	83
Piedmont Station.....	36	76	New Orleans	54	80	Brussels.....	35	64	Sydney*.....	72	50
Lynchburg.....	44	78	Cincinnati.....	33	76	Berlin.....	18	68	Melbourne*.....	65	48
Staunton.....	41	75	Charleston, S. C.....	48	80	Vienna	29	71	Hobart Town*.....	62	44
Lexington.....	43	79	Washington, D. C.....	34	78	Rome.....	46	76	Auckland*.....	68	49
Wytheville.....	37	74	New York.....	30	75	Constantinople.....	41	74	Peking.....	25	81
Fairfax Courthouse....	38	82	Boston	25	72	Odessa	26	73	Shanghai.....	40	83
			Eastport, Maine.....	22	62	St. Petersburg.....	16	63	Manila	77	80
			Fort Snelling.....	13	73	Moscow	14	76			
			Natchez	52	81	Stockholm.....	24	64			
			IN N. A.			Bergen	35	60			
			Montreal.....	15	73	Cairo, Egypt.....	56	86			
			Havana.....	65	85						
			Bermudas	32	84						

* These are in South Latitude, so seasons are opposite.

The averages of Virginia are from Smithsonian observations; the others from Guyot's Physical Geography.

It is not a perfectly fair comparison to take the *means* of one year and compare them with the average of a number of years; still the results are approximate, and are the best that can now be had.

These tables of temperature suggest the *possibilities* of production in Virginia, and show that it has a wide range of *annual* temperatures from which selections may be made.

The United States Signal Service contributed to the atlas before mentioned a chart "showing the mean temperature at 4.35 P. M. of the hottest week of 1872, and at 7.35 A. M. of the coldest week of 1872 and 1873," compiled from the abundant data of that most important office. On this chart the mean of 90° occupies the same position as the isotherm of 60° just described, passing from the Eastern Shore southwest across North and South Carolina, and around, south of the Appalachian system of mountains, and back northeast nearly through Ohio, and on to the west and northwest. A small portion of country near Washington and the Potomac is also in an area of 90°, but some 95 per cent. of the State is between 85° and 90° in the *hottest* week. The curve of mean *cold* for the coldest week was 20°, which passed southwest across Tidewater, and through North Carolina, Tennessee, Alabama, Mississippi, &c. The 10° of cold passed through New York city west, by Wheeling, Cincinnati, into Arkansas. The 0°, or zero, ran through New York, Michigan, Illinois, Missouri, Kansas, &c. These facts also show the medium character of the Virginia climate.

The RAIN-FALL is next in importance to the temperature in the climate of a country, for heat and moisture are the two great requisites for abundant production when a fertile soil is present.

*Guyot, a standard authority, says: "North America has in the eastern half a greater amount of rain than either of the other northern continents in similar latitudes." * * "The great sub-tropical basin of the Gulf of Mexico sends up into the air its wealth of vapors to replace those lost by the winds in crossing the high mountain chains. Hence the eastern portions—the great basins of the Mississippi and the St. Lawrence and the Appalachian region—which, without this source of moisture, would be doomed to drought and barrenness, *are the most abundantly watered, and the most productive portions of the continent.*" "In the eastern half of the United States the southwesterly winds which prevail in the summer spread over the interior *and the Atlantic plains* an abundant supply of vapors from the warm waters of the Gulf. Frequent, copious showers refresh the soil during the months of greatest heat, which show a maximum of rain. *Thus the dry summers of the warm-temperate region disappear*, and with them the periodical character of the rains so well marked elsewhere in this belt."

These quotations show the advantages Virginia has, in this respect, over the warm-temperate regions of Europe and elsewhere.

The "RAIN CHART" accompanying the census of 1870, and forming Plate V. of the Statistical Atlas (also by Professor Henry), shows the mean precipitation in rain

and melted snow for the year in the United States—the mean average of numerous observations, by isohyetal lines—that is, lines connecting places that have the same average annual rain-fall. Virginia lies mostly in the belt of country where the annual amount of precipitation is from 32 to 44 inches. One curve of 40 inches runs through Washington city, then nearly west to Warrenton and Woodstock, and on to Charleston, West Virginia; another passes eastward from the mouth of the Greenbrier river to Richmond, where, by a bold curve, it turns southwest through Hicksford and on to Greensboro', North Carolina. Parallel to and west of the last named is a curve of 36 inches of fall; another curve, that of 44 inches, lying north-east of the latter and parallel to it, includes a belt of country reaching across the State from Rockingham county to Norfolk. To sum up the results of this chart—

Tidewater is in the belt of 32 to 44 inches of fall, *except* the Southside, Richmond, Williamsburg, Pamunkey and Gloucester peninsulas, which are in that of 44 to 56 inches—a strip northwest from the opening of Chesapeake bay.

Middle is in the belt of 32 to 44, except the part between the Rappahannock and the Pamunkey, or North Anna, which is in the 44 to 56 inch belt—the extension of the same from Tidewater.

Piedmont, *Blue Ridge* and the *Valley* are all put down in the region of 32 to 44, except that a portion of the belt of 44 to 56, just mentioned, continues across north-west, including Rockingham and part of Augusta counties, to the west side of the Valley.

Appalachia is entirely in the district of 32 to 44 inches of deposition—the one in which most of the great Central States of the Union, east of the Mississippi, are situated.

The following table gives the inches of rain and melted snow that fell in Virginia, for the seasons of the period embraced in the temperature table and for the same stations:

SEASONS, &c.	TIDEWATER.				MID.	PIED.	VALLEY.		
	Johnsontown.	Hampton.	Zuni.	Comorn.	Vienna.	Piedmont Sta.	Staunton	Lexington.	Wytheville.
1869-'70.	Spring.....	8.60	9.20	.....	7.59	.....	10.84	12.14	8.46
	Summer.....	7.85	12.60	.....	6.10	.....	3.75	5.15	6.20
	Autumn.....	7.90	6.10	10.07	12.08	10.51	.....	5.04	8.59
	Winter.....	8.25	9.95	10.84	6.12	12.10	12.25	10.83	12.33
	Year.....	32.60	37.85	.....	31.89	.....	33.46	39.53	32.61
1870-'71.	Spring.....	12.78	13.50	14.81	8.03	13.90	15.90	13.47	9.40
	Summer.....	7.05	12.60	8.80	8.53	13.90	10.85	13.80	11.31
	Autumn.....	5.60	7.50	6.97	5.28	8.50	13.65	14.93	20.52
	Winter.....	8.34	8.85	.....	4.82	10.30	7.70	8.81	.....
	Year.....	33.77	42.45	.....	26.66	46.60	48.10	50.51	37.55
Irregular Year.....	.....	.....	37.42	.....	.....	.....	.....	.....	.....

The table on next page presents the *monthly precipitation*, the totals of which are embraced in the preceding table.

SEASONS, &c.		TIDEWATER.				MID.	PIED.	VALLEY.		
		Johnsontown.	Hampton.	Zuni.	Comorn.	Vienna.	Piedmont Stn.	Staunton.	Lexington.	Wytheville.
SPRING.	March—1869	2.80	3.00	....	1.95	....	....	5.06	3.78	3.15
	April	1.10	1.50	....	2.20	....	....	1.71	3.42	1.29
	May	4.70	4.70	....	3.44	....	....	4.07	4.94	4.02
		8.60	9.20	....	7.59	....	....	10.84	12.14	8.46
SUMMER.	June	3.80	2.80	....	3.05	....	....	1.40	2.60	2.88
	July	3.85	6.30	....	2.44	....	....	1.70	1.02	1.38
	August	0.20	3.50	....	0.61	....	....	0.65	1.53	1.94
		7.85	12.60	....	6.10	....	....	3.75	5.15	6.20
AUTUMN.	September	2.20	1.10	3.68	3.29	3.71	....	3.84	4.73	4.20
	October	3.45	3.80	4.97	6.98	5.80	....	3.14	3.88	2.70
	November	2.25	1.20	1.42	1.81	1.60	1.80	1.06	1.33	1.60
		7.90	6.10	10.07	12.08	10.51	....	8.04	9.99	8.50
WINTER.	December	2.55	3.55	4.53	2.90	7.10	6.40	5.13	5.47	4.10
	January—1870	2.60	3.30	3.04	1.71	2.90	3.30	3.40	4.65	2.35
	February	3.10	3.10	3.27	1.51	2.10	2.55	2.30	2.21	3.00
		8.25	9.95	10.84	6.12	12.10	12.25	10.83	12.33	9.45
SPRING.	March	4.08	2.70	3.61	1.78	3.70	5.35	3.66	3.50	4.30
	April	3.00	5.50	3.61	2.10	5.50	5.25	3.92	4.51	2.80
	May	5.70	5.30	7.59	4.15	4.70	5.30	5.89	5.40	2.30
		12.78	13.50	14.81	8.03	13.90	15.90	13.47	13.41	9.40
SUMMER.	June	3.20	7.70	5.02	4.75	4.70	7.70	6.73	3.60	5.80
	July	3.40	2.55	1.78	2.97	7.70	0.80	4.33	4.56	2.50
	August	0.45	2.35	2.00	0.81	1.50	2.35	2.74	3.15	7.60
		7.05	12.60	8.80	8.53	13.90	10.85	13.80	11.31	15.90
AUTUMN.	September	1.05	3.70	1.68	1.25	2.20	9.55	11.24	15.88	1.30
	October	2.55	2.25	2.75	3.09	5.00	2.10	2.13	2.87	2.80
	November	2.00	1.55	2.54	0.94	1.30	2.00	1.56	1.77	1.55
		5.60	7.50	6.97	5.28	8.50	13.65	14.93	20.52	5.65
WINTER.	December	2.15	2.50	3.80	0.99	3.40	2.30	2.05	2.04	1.40
	January—1871	2.19	2.60	....	1.49	3.70	3.00	2.81	....	2.35
	February	4.00	3.75	....	2.34	3.20	2.40	3.45	4.18	2.85
		8.34	8.85	....	4.82	10.30	7.70	8.31	....	6.60

These tables show that the precipitation is well distributed among the seasons and throughout the State, confirming the statement of Professor Guyot, just quoted, in regard to the rains of this portion of the United States.

The amount of rain-fall at Piedmont, Staunton and Lexington in September, 1870, is very many times more than the normal quantity. It was the result of an unprecedented storm that poured out its waters in a flood over a limited area at the sources of the Shenandoah and the James. It will be noted that the spring and winter rains are more abundant than those of fall and summer. Generally the rain-fall is moderate in April and early May, the *planting and sowing* time; in late May and early June more abundant, the *growing* season; less in late June and in July for the *harvest* time; still less in August and September, for thoroughly drying the already cut wheat, and giving it the character so highly prized in the markets, and for maturing Indian corn. The autumn seeding is done in September and October, and the later rains then follow.

Guyot's tables give the mean annual rain-fall of a number of places as follows,

in English inches and hundredths, viz: In the United States—Richmond, 38.29; Fortress Monroe, 47.04; Washington city, 41.05; Cincinnati, 44.87; Memphis, 45.46; New York, 44.59. In Europe—Edinburg, 19; London, 19; Paris, 23; Vienna, 18; Berlin, 23; Naples, 31. In Australia—Sydney 83, and Auckland (N. Z.) 48.

The "comments" on the weather, &c., at the stations selected in Virginia often give a better idea of the actual condition of things than the "means" of tables. Extracts from these will be given for the months taken in the order of the tables:

MARCH, 1869.—At Johnstown strawberries bloomed the 17th, peaches the 23th; at Hampton, hyacinths 15th, peaches 22d, wild plum 24th; at Bacon's Castle, daisy 8th, plum and peach 23d, Indian corn planted 25th, martins appeared 27th; at Zuni, cloudy but favorable to farmers; at Comorn, colder than January or February, but no thick ice; at Lexington peas planted 4th, potatoes 12th, and oats sown 18th; at Wytheville, cold and wet. Elsewhere in the United States: in Maine sleighing the whole month, temperature below zero on 6 days; in Vermont snow 4 or 5 feet deep, and ice on Connecticut river 2 feet thick on 31st; in New York good sleighing at Buffalo until 22d; in Tennessee snow at Memphis 11th, and rain froze in gauge 15th; in Ohio 5 inches of snow at Kelley's Island 22d; and in Minnesota sleighing at St. Paul until the 23d.

APRIL.—There were hard frosts in Virginia 11th and 15th; at Johnstown cherry and plum in bloom 6th; at Comorn apple in blossom the 24th; corn-planting at Lexington 25th. Elsewhere: snow left Amherst, Massachusetts, 20th; ice still in Buffalo harbor, New York, 30th, and six snows there during the month; at Toledo, Ohio, four snows, and peaches blossomed the 30th; at Milwaukee, Wisconsin, frost 25th; in Nebraska "grasshoppers by millions" the 7th, and peaches in bloom 28th. Frost in all the Southern States, and snow and ice in the Northern.

MAY.—At Johnstown a frost on 9th killed tender vegetables, locust bloomed 13th and rye 15th; at Bacon's Castle *peanuts were planted 4th to 14th*, slight frost and hail 3d, *cherries were ripe 26th*; at Comorn locust in bloom 18th, *strawberries ripe 24th*; at Lexington frost 8th and 18th, and at Wytheville several times, but locust bloomed 29th. Elsewhere: Buffalo, New York, ice in harbor 16th, apple in bloom 29th—*35 days later than at Comorn*; mean temperature of spring at Memphis, Tennessee, 58°.05 and rain-fall 16.90 inches; frosts in North Carolina 7th, 8th and 20th; at Kelley's Island, Ohio, peaches bloomed 10th (*41 days after those at Johnstown*), and apples 24th; at Winnebago, Illinois, cherry flowered 12th (*36 days later than at Johnstown*); at Dubuque, Iowa, cherry in bloom 9th; at Nebraska city frost 17th; storms and frosts all the month at Milwaukee.

JUNE.—At Bacon's Castle *hay*ing began 16th, *blackberries were ripe 27th*; *wheat harvest* began at Comorn 21st, Lexington 28th, and Wytheville 23d; clover hay cut at Lexington 21st and strawberries ripe 1st. Elsewhere: no harvesting was done in any of the Northern or Western States, except in Missouri 17th, and some barley in southern Pennsylvania 24th, and southern Indiana 30th; no haying done but in New Jersey 16th, southern Indiana 18th, and Pennsylvania 28th; strawberries were ripe at Buffalo, New York, the 21st (*28 days later than at Comorn and 20 later than at Lexington*); frosts in Kansas and Nebraska 5th.

* In Smithsonian Reports, published by U. S. Department of Agriculture.

JULY.—The hottest at Hampton in 22 years, and vegetation suffered some, but rains revived it; same remarks apply to Zuni and Bacon's Castle; very dry at Lynchburg, Lexington and Wytheville. Elsewhere: cold and dry in Northern and Northeastern States; wheat harvest began in southern Pennsylvania 2d (11 days later than at Comorn), and in New Jersey 5th; oat harvest began in Pennsylvania 22d; Texas had continuous rains and floods; heavy, cold rains in the West and some frosts; haying in Wisconsin 23d (37 days *later* than at Bacon's Castle); harvest began in Iowa 19th (27 days *later* than at Wytheville).

AUGUST was hot and dry in Virginia until the last of the month, when rains came; there was a frost that did no damage, at Lexington, on the 8th, and Wytheville 9th—the same killed corn in Maine, buckwheat in Pennsylvania, and formed ice in Wisconsin, where wheat harvest began 6th (*only* 46 days after Comorn); heavy rains and high waters throughout the West.

SEPTEMBER was very dry in Virginia until 25th, with *slight* frosts 28th and 29th at Johnstown, Zuni, Bacon's Castle, Comorn and Lexington, and heavy at Wytheville; also slight one at Lexington 3d and at Wytheville 2d, 3d and 4th. The frost of the 28th extended over the whole United States north of the latitude of Central Alabama; it froze the ground and formed ice in many parts of the North and West, damaging the corn. At Johnstown it was 143 days between frosts, and at Monticello, Iowa, 111.

OCTOBER brought killing frosts at Johnstown 17th, Hampton 18th, Zuni 16th, Bacon's Castle 14, Comorn and Vienna 25th, Lexington and Lynchburg 14th. At Bacon's Castle it was 188 days between frosts; the first ice formed 27th at Johnstown, Zuni, Lynchburg and Vienna, and at Bacon's Castle 14th; the first slight snow was 30th in Tidewater, 28th at Vienna and 20th at Wytheville. Elsewhere: eight inches of snow at Buffalo, New York, 25th, killing frost in Mississippi 16th, skating in Michigan 26th and twenty-three inches of snow. Generally reported as the coldest October ever known in the West. Floods numerous, with ice and snow, in the North.

NOVEMBER was calm and cold, but pleasant in Tidewater; the month was unusually cold, with severe snow-storms and loss of life in the Northwest; the farmers in many parts of the North and West did not succeed in getting their potatoes dug, the snow having covered the ground so early.

DECEMBER did not give a flake of snow at Hampton, and roses were in bloom out of doors at Zuni on New Year's day. The mean temperature at Zuni for 1869 was 58°.54, and the rain-fall 37.78 inches; at Piedmont snow lay on the ground from 18th to 26th; it was cold at Wytheville. Elsewhere it was damp and cloudy, but not very cold. The mean temperature of 1869 at Hillsboro', Central Ohio, was 50°.24 and the rain-fall 38 inches; at Milwaukee, Wisconsin, it was 44°.44 and 37.81 inches, and in December it was 26°.37 and 2.79 inches; at Leavenworth, Kansas, for 1869, the temperature was 50°.35 and the rain 43.35 inches.

JANUARY, 1870.—At Johnstown peaches in flower 31st; at Hampton weeping willow in leaf 31st; at Zuni red maple in bloom 26th; at Bacon's Castle gangs of robins 9th, daisy blooms 21st and alder 24th; at Comorn plowing was done all the month; at Piedmont birds began to sing 12th and plowing commenced 22d; at Lynchburg peas were sown 14th and were up 24th, when potatoes were planted.

A great gale on the 2d, and storm of wind, rain and snow on 16th and 17th, extended over the west—the one of the 2d reached Wytheville as a deep snow; teams crossed the Mississippi on the ice, in Illinois, on the 18th; snow was two feet deep in Minnesota 31st; ice on rivers in Nebraska, fifteen inches thick, 23d; at Leavenworth, Kansas, 16th it was 50° degrees at noon and —1° at 8 P. M., killing peach buds.

FEBRUARY.—At Johnstontown violets in bloom and frogs croaking 17th, and some snow 23d; at Hampton hyacinths in flower 10th, ground froze 9th, frosts 21st and 22d, plowing began again 25th; at Bacon's Castle elms and filberts in blossom 5th; at Comorn plowing done the whole month; at Vienna light snow 8th and 28th, blue birds 3d, wild geese 8th; at Piedmont ground frozen 24th; at Lynchburg snow 7th and 8th, ice 22d, robins 13th, and frogs 26th; at Wytheville wheat looking well, people making maple sugar. Many and deep snows, ice and cold weather in all the Northern and Western States; at Pittsburg, Pennsylvania, ice five inches thick on river last of month; frost and ice even in Florida and Texas 21st, and in New Orleans 18th to 20th. The mean of January at Belvidere, Illinois, 22°.98 and of the winter 22°.66; at Nebraska city ground frozen twenty inches deep on the 18th.

The same comments for the next year, 1870-'71, would show nearly the same condition of things. Corn-planting began in Tidewater April 13th, and on the 17th the temperature in Kansas and Nebraska was below freezing all day. Rye "headed" at Johnstontown May 1st and wheat at Piedmont 22d. May was so dry in Texas that water sold for a dollar a barrel at Lavacca, and the drouth extended over all the Northwest. Harvest began at Piedmont June 24th. In Illinois the temperature in some places, in June, was over 100° for a week. Peaches were ripe at Surry courthouse July 13th. The average rain-fall for July, for twenty-one years, at Comorn, was 3.88 inches. The mean temperature for July, for sixteen years, at Cleveland, Ohio, 72°.61 and 3.26 inches of rain—this year 10.15 of rain. At Iowa city the *mean temperature* was 84.68 from 13th to 27th of July. At Lawrence, Kansas, it was above 90° on twenty-two days of July, and at Holton, in same State, over 100° on nine days; at Chico, California, every day above 90° and twenty-one over 100°, and much the same at Visalia. The mean for the summer was, at New York 76°.43, Winnebago, Illinois, 72°.56. At Deer Lodge City, Montana, the squirrels went into winter quarters August 10th, and snow came 18th. At Lawrence, Kansas, there was a *heated term* of fifty days, the heat above 90° on forty-six. The first frost in Virginia was at Vienna September 12th, when a killing one was general in the North; there was none at Wytheville until the 21st, and none in Tidewater.

The renowned Captain John Smith, one of the first royal governors of Virginia, sums* up the climate of Tidewater Virginia, the only part he knew, by saying: "The temperature of this country doth agree well with English constitutions, being once seasoned to the country." "The summer is hot as in Spain; the winter cold as in France or England. The heat of summer is in June, July and August, but commonly the cool breezes assuage the vehemency of the heat. The chief of winter is half December, January, February and half March. The cold is extreme sharp, but here the proverb is true, that '*no extreme long continueth.*' From the southwest came the greatest gusts, with thunder and heat. The northwest wind is

*History of Virginia, vol. 1, p. 113.

commonly cool and bringeth fair weather with it. From the north is the greatest cold, and from the east and southeast, as from the Bermudas, fogs and rains."

Thomas Jefferson, President of the United States, whose residence was on Monticello, in the Southwest Mountain range, the barrier between Middle and Piedmont Virginia, made the following observations* after giving this table of the winds:

	N. E.	S. E.	S. W.	N. W.	Total.
Williamsburg	127	61	132	101	421
Monticello.	32	91	126	172	421

"By this it may be seen that the southwest wind prevails equally at both places, that the northeast is, next to this, the principal wind towards the sea coast, and the northwest is the predominant wind at the mountains. The difference between these two winds to sensation, and in fact, is very great. The northeast is loaded with vapor, insomuch that the salt makers have found that their crystals would not shoot while that blows; it brings a distressing chill, is heavy and oppressive to the spirits: the northwest is dry, cooling, elastic and animating. The eastern and southeastern breezes come on generally in the afternoon." The more extended observations that have been quoted can be studied to advantage aided by these comments.

The direction from which the winds† at Staunton blew for a year, from October, 1868, were as follows:

WIND—FROM	7 A. M.	2 P. M.	9 P. M.	Total.
North	10	19	19	48
Northwest	21	31	23	75
East	8	14	15	37
Southeast	128	76	77	281
South	32	28	22	82
Southwest	63	92	83	238
West	11	24	21	56
Northwest	102	79	90	271

This table shows that the prevailing winds are from the "*south quadrants*." It is more than likely, from the location of the place of observation, that southwest winds were often changed to southeast by the near high hills.

* Notes on Virginia.

† MS. records of D. D. & B. Inst.

The direction of the winds* for the year 1857, at a number of places in Virginia, was as follows, viz :

	TIDEWATER.			MIDDLE.		PIED.	VAL.	AP.
	Portsmouth.	Smithfield.	Rose Hill.	Alexandria.	Crichton's Store.	Rougemont.	Berryville.	Wirt C. H.
From North.....	131	101	89	113	251	84	86	13
From between North and East.....	192	118	134	169	55	44	88	42
From East.....	56	95	54	33	34	80	56	2
From between East and South.....	95	62	77	71	29	14	101	98
From South.....	81	184	84	235	163	267	130	25
From between South and West.....	228	160	182	99	325	118	169	375
From West.....	100	112	66	72	117	223	195	9
From between West and North.....	207	112	76	271	77	70	205	260
Calm or Variable.....	1	0	158	2	20	45	33	202
TOTALS.....	1,091	944	920	1,065	1,071	945	1,063	1,026

Portsmouth is in Norfolk, Smithfield in Isle of Wight, and Rose Hill in Essex counties, Tidewater; Alexandria is in Alexandria, and Crichton's Store in Brunswick counties, Middle Virginia; Rougemont, in Albemarle, is in Piedmont; Berryville, in Clarke county, is in the Valley, and Wirt courthouse, in West Virginia, stands for Trans-Appalachia, and shows "how the wind blows" there. A comparison of the numbers of the table will give the prevailing winds of each section, and show how they differ. The Signal Service chart,† showing the annual means of the barometer for 1872-3, shows that the mean barometer 30.05 crossed the State near the parallel of 37° 30'. The same chart gives the results of the winds—or total movement of the air for the same year—by diagrams, which show that the prevailing winds of the State are from the west and northwest—and that they are moderate in velocity. There are but few "high winds" in Virginia.

At Staunton, Augusta county, in the Valley, the following observations‡ were made for the year beginning October, 1868: At 7 A. M. the sky was without clouds 91 times, entirely overcast 61 times, partly cloudy 204 times; at 2 P. M. it was entirely clear 60, entirely cloudy 63, and partially cloudy 243 times; at 9 P. M. it was clear 167, cloudy 51, and partially cloudy 148 times. There were 42 days without a cloud. These results show that most of the time the weather is what would be called "clear"—and this is rendered more apparent by the record of the rain and snow fall for the same period, during which 32.1 inches of rain and

* Smithsonian results. † Plate X. of Statistical Atlas.

‡ By Deaf, Dumb and Blind Institute, from the manuscripts.

melted snow fell at 61 different times, or on that many different days, 51 being rain and 10 snow. The whole depth of snow fall for the year was 38.5 inches.

In 1858*, for the year, at Portsmouth, Norfolk county, the mean cloudiness was 3.60—that is, 360 times out of 1,000 the sky was overcast; at Smithfield, Isle of Wight county, it was 5.28; at Crichton's Store, Brunswick county, 5.07; at Rougemont, Albemarle county, 5.48. These figures will give a good general idea of the state of "the face of the sky" in Virginia.

The Signal Service office furnished the data for a chart of the United States, showing the Frequency of Storm Centres—published as Plate VI. of the Statistical Atlas. This chart shows the number of storm centres, of areas of low barometer that passed over any given district from March, 1871, to February, 1873, inclusive. It is said in the Statistical Atlas: "This chart is of interest in connection with all statistics bearing on the security of navigation, and on the habitability of a country, and the diseases that originate in the sudden changes of weather that attend storms." Tidewater, except that part of it north of a line from Richmond city to Point Lookout, is in the belt of country over which from 5 to 10 storms passed—the same belt extends for 150 miles or more out to sea along the Virginia coast—it is the belt which embraces much of the States of Pennsylvania, West Virginia, Kentucky, Indiana, Missouri, &c., and all of Ohio. All the remainder of Virginia, Middle, Piedmont, Blue Ridge, Valley and Appalachia, are in the belt of the fewest number of storms—only from 1 to 5—a result that might have been expected by any one familiar with the State. Most of the New England States, large portions of New York, Michigan, Wisconsin, Illinois, Iowa, &c., are in the belt of from 10 to 15—and large areas of New England and of the States near the Great Lakes, including Canada, &c., are crossed by the belts of 15 to 20; 20 to 22.5 and of over 22.5. The effects of these storms are evident in the "disease" and "death rate" maps and statistics of the country.

The advantages of the climate of Virginia may be summarized thus:

1st. It is a *dry* climate, that is, while it has an *abundance* of moisture, it is nowhere *damp*.

2nd. It is a *mild* climate, for, while it is sometimes very cold or very warm, neither of these last long—the general temperature is a medium one.

3rd. It is a climate *favorable to agricultural operations*; the *length of its growing season*; the *distribution of its rain throughout the year*; the *shortness and mildness of the winter*; the *long periods adapted to seeding and harvesting*, &c., are all well attested facts.

4th. It is a *very healthy climate*:—in no part of the world is there a more general state of health or a more long-lived and vigorous people, as proven by the statistics—and in no country in the temperate zone do the inhabitants, from choice, stay more in the open air and open their houses to the "weather."

5th. It has a *great variety of climate* from that of the low sea coast plains, through all gradations, up to that of great valleys and table lands thousands of feet above the sea:—this provides localities for a widely varied production and for the choice of a habitation.

* Smithsonian results.

CHAPTER IV.

THE PRODUCTIONS OF VIRGINIA.

SECTION I.—ANIMAL PRODUCTS.

The climate of Virginia is favorable for the growth and the products of its soil for the sustenance of animal life, consequently it has an abundant and vigorous native fauna on its land and in its waters. All the varieties of domestic animals reared in temperate climates have here found a congenial habitation, and excellent breeds of horses, mules, milch cows, working oxen, beef cattle, sheep, swine, goats, and poultry, abound in all sections of this State.

Before presenting the facts of production in Virginia, most of which are drawn* from the census of 1860, it may be of interest to present, from the same census, the statements in regard to the "*Lands*" of the State, the *Value* of the same, and of the farming implements and machinery in use:

SECTIONS.	ACRES OF LAND.			Cash Value of Land.	Value of Farming Implements and Machinery.
	Improved.	Woodland.	Total.		
Tidewater.....	2,034,399	2,216,990	4,139,389	59,993,096	1,701,909
Middle.....	2,882,525	3,148,376	6,030,901	63,105,528	1,985,496
Piedmont.....	1,951,427	1,849,149	3,791,576	65,870,771	1,638,127
Blue Ridge.....	162,567	413,944	576,501	3,322,761	133,799
The Valley.....	1,520,873	1,810,512	3,331,385	63,249,035	1,601,459
Appalachia.....	539,913	1,708,987	2,248,900	17,695,383	358,830
TOTALS.....	9,091,694	11,128,958	20,417,752	\$273,236,274	\$7,419,611

A comparison of these figures with those of areas, &c., in Chapter I., will give a good idea of proportional amounts of cleared land, woodland, &c., in each section.

*By direction of the Board of Immigration.

Virginia had more acres of cleared land than any of the States of the Union, except Illinois, New York and Pennsylvania, which had, in round numbers, 13, 14 and 10 million acres respectively. She was the eighth in the quantity of unimproved land, having about the same quantity as Kentucky or South Carolina, and nearly twice as much as California, Iowa, New York or Pennsylvania. The cash value of Virginia lands placed her in the 7th rank, the order being, 1st New York, 2d Ohio, 3d Pennsylvania, 4th Illinois, 5th Indiana, and 6th Kentucky, the last being but a little in advance of Virginia.

The following table shows the *Number, and Size in Acres, of the Farms* in Virginia in 1860:

SECTIONS.	Number over 3 and under 10 Acres.	Over 10 and under 20.	Over 20 and under 50.	Over 50 and under 100.	Over 100 and under 500.	Over 500 and under 1000.	1000 Acres and over.	No. of Farms of all sizes.
Tidewater	385	845	2,929	3,325	5,331	667	148	13,630
Middle.....	255	543	2,016	2,928	7,905	1,032	202	14,881
Piedmont.....	165	355	1,909	2,423	5,435	602	135	11,024
Blue Ridge.....	28	109	628	670	574	13	2	2,024
The Valley.....	102	320	1,616	2,624	5,484	296	57	10,499
Appalachia	132	418	1,440	1,330	1,703	74	33	5,130
TOTALS.....	1,067	2,590	10,533	13,300	26,432	2,684	577	57,188

Milch Cows and *Dairy Products* are of the first importance in the estimation of the husbandman—and the physical vigor of any people is largely dependent upon their abundance.

The number of milch cows, and the butter and cheese produced in the several sections of Virginia, in 1860, are shown in the following table:

SECTIONS.	No. of Milch Cows.	Butter. (Pounds.)	Cheese. (Pounds.)	Pounds of Butter to each Cow.	Cows to each 100 People.
Tidewater	43,876	1,085,671	755	22.4	13
Middle.....	63,564	1,911,902	4,274	30.0	17
Piedmont.....	46,681	2,816,054	10,190	60.3	22
Blue Ridge.....	6,805	269,416	15,030	39.5	28
The Valley.....	44,643	2,463,400	78,316	55.0	23
Appalachia	25,090	776,505	40,707	39.4	32
TOTALS.....	230,659	9,322,948	149,272	40.4 Av.	20 Av.

The statistics of other portions of the United States, for 1860, give these results:

	Pounds of Cheese to each Cow.	Pounds of Butter to each Cow.	Cows to each 100 People.
New England States.....	32	75	21
Middle States.....	25	87	24
Western States.....	10	58	27
Southern States.....	15	22	29
Pacific States.....	5	15	...
United States—average.....	16	53	27
England, in 1874.....	...	...	9

The production of butter was very creditable to Virginia, when it is considered that dairying was not at that time one of the established industries of the State as in New England and the Middle and Western States; it was only incidental to the rearing of cattle for market, especially in the Blue Ridge, Valley and Appalachian sections—in fact, at that time, butter and cheese were rarely produced for market in all the southwestern portions of the State.

The cost of producing a given quantity of butter and cheese is much less in Virginia, owing to its milder climate and longer seasons, than in many other States of the Union. The statistics of production show the effects of elevation above the sea of portions of the State, giving them more adaptability to natural grasses and to the dairy business. The production of cheese by the “factory” system has of late been undertaken in Piedmont. The “Old Dominion Cheese Factory,” in Loudoun county, reports, for 1871:

Milk received from May 6th to September 8th.....	378.133 pounds.
Cheese manufactured from above.....	36,625 “
Milk consumed for one pound of cheese.....	10.3 “
Average net price received for cheese, deducting boxes, freight and all expenses but manufacturing.....	12½ cts. per lb.
Value of 36,625 pounds of cheese, @ 12½ cents per pound.....	\$4,715.47.
Average number of cows milked.....	125.
Charges for manufacturing, curing, boxing, furnishing mate- rials (except boxes), selling, collecting and dividing among partners in proportion to milk furnished and cheese made, 2½ cents per pound.....	\$915.62.
Giving for each cow a return of.....	\$30.39.

It was ascertained that the milk used in making one pound of butter would make three pounds of cheese.

This company, in 1874, manufactured 174,143 pounds of milk into 16,152 pounds of cheese, averaging one pound of cheese to 10.78 of milk: the average price received for cheese was 15 cents per pound.

It was estimated by the officers of the above mentioned company that the entire cost of a factory, in working order, for manufacturing into cheese the milk of from 400 to 600 cows, would be about \$3,000. They also conclude that generally cheese can be made with profit during six or eight months of the year, and that the article produced is as good as any made in the United States; results to be expected when all the circumstances are known.

A farmer (J. K. Taylor) in the same county gives the following results of dairying in 1871, with eight cows:

2,640 pounds of cheese made from May 6th to September 8th, or 80 pounds a month to each cow.

Received for cheese (10½ cents per pound net) after deducting all expenses.....	\$272 00
Received for 329 gallons milk, @ 11 cents per gallon, from September 8th to December 1.....	36 19
Received for 120 pounds butter, @ 25 cents per pound, from September 8th to December 1, expenses deducted.....	30 00
Value of 7 calves reared.....	49 00
Profit, averaging \$48 39 for each cow.....	<u>\$387 19</u>

The value of a thoroughbred calf. \$100, was not included.

Another farmer (T. R. Smith) in the same county, reported for 1871, from 10 cows kept:

2,640 pounds of cheese, worth.....	\$273 81
979 pounds of butter, worth.....	297 14
10 calves, worth.....	61 40
	<u>\$632 25</u>
Deduct 3 tons of mill feed consumed.....	60 00

Averaging \$57.23 to the cow, but making no deduction for cost of making butter.

E. J. Smith, from the same county, reports for an average of 10½ cows:

For 2,790 pounds of cheese, net value.....	\$288 39
For 765 pounds of butter, @ 30½ cents per pound.....	236 05
For calves	33 50
	<u>\$557 85</u>

Or \$46.03 per cow, with no deduction for making the butter.

These facts from Loudoun county give a fair estimate of the profits of the dairyman in Piedmont Virginia, and as the conditions of the Blue Ridge, Valley and Appalachia are much the same, it may be taken as an average for the sections named, the advantages of nearness to market in some districts being compensated for by diminished cost of production in others. A cheese factory has been operated in Smyth county.

The butter produced in Virginia in 1860 was 7.6 pounds to the person. In the dairy States it was 21.5. When the location of Virginia is considered, so near to the large cities of the Atlantic, the great consuming centres of dairy products, in conjunction with its extensive pasture lands covered by nutritious natural grasses, where pure water abounds and the climate is genial, it will appear that it offers superior attractions to the dairy farmer.

Sheep have always thriven in Virginia, and the *wool* here grown has an established reputation for excellence of quality. Wherever the business of rearing sheep, for wool or for mutton, has been judiciously conducted, it has proven remunerative. Few States have as many special adaptations for sheep husbandry:—extensive areas of cheap, elevated lands, covered with natural grasses; broad plains suited for root culture; short winters and a comparatively dry climate, with nearness to markets.

The following table presents the statistics of sheep in 1860:

SECTIONS.	Number of Sheep.	Number of Sheep to each Person.	Pounds of Wool Produced.	Pounds of Wool to each Sheep.
Tidewater.....	84,125	0.24	192,028	2.23
Middle.....	153,066	0.41	310,380	2.02
Piedmont.....	120,309	0.57	377,283	3.13
Blue Ridge.....	29,223	1.19	55,849	1.91
The Valley.....	124,746	0.64	337,177	2.70
Appalachia.....	79,466	1.07	164,149	2.06
TOTALS.....	590,935	Av. 0.48	1,436,866	Av. 2.43

The following similar statistics, for 1860, furnish comparative data:

	Number of Sheep to each Person.	Pounds of Wool to each Sheep.
New England.....	0.56	3.62
Middle States.....	0.53	3.28
Western States.....	0.88	2.82
Southern States.....	0.54	1.95
Pacific States.....	.....	1.63
United States.....	0.71	2.68
Great Britain, in 1874..	1.20	.....
Spain.....	1.33	.....
France.....	0.44	.....
Australia*.....	33.00	.....

* The number of sheep in Australia more than doubled from 1862 to 1874.

It will be seen that the average production per sheep for Virginia is but little below that for the United States as a whole, while Piedmont is nearly equal to New England, the most productive section of the country in this particular, and where sheep husbandry is extensively carried on. It should also be borne in mind, that in Virginia the lands are cheap and the winters short, two essentials, when the soil and climate are favorable, for the cheap rearing of sheep and production of wool.

The United States imported, between 1860 and 1870, over 500,000,000 pounds of wool, at an average price of 15.7 cents, gold, per pound—a fact proving that here is an excellent field for the business of sheep rearing.

Experience has shown that lambs can be raised in Virginia, in the spring, and sent to the great northern markets long before they can be put there from the farms nearer; consequently good prices can be realized. The low priced lands of Tidewater and Middle Virginia are especially well situated for thus supplying early lambs, and large areas there are well adapted to the growing of swedes, mangolds, and other crops that are so extensively cultivated in England and elsewhere for fattening sheep.

Angora Goats have been successfully and profitably raised in Piedmont and Middle Virginia, furnishing large fleeces of the valuable Cashmere wool.

Bees find in the sections of this State an abundant flora, and the long and comparatively dry seasons are peculiarly favorable for apiculture—especially does this seem to be the case in Piedmont, where large profits are reaped by those that have given some attention to this pleasant home industry.

The production in 1860 was:

SECTIONS.	Honey. (Pounds.)	Beeswax. (Pounds.)	Pounds to each Person.
Tidewater	69,976	7,037	$\frac{1}{6}$
Middle	253,502	20,635	$\frac{2}{3}$
Piedmont.....	326,518	24,251	$1\frac{1}{2}$
Blue Ridge.....	29,947	2,725	$1\frac{1}{5}$
The Valley.....	161,847	9,040	$\frac{4}{5}$
Appalachia	166,442	10,656	$2\frac{1}{10}$
TOTALS	1,008,232	74,374	Av. $\frac{2}{6}$

Virginia produced 1-23rd of the honey crop of the Union in 1860. This profitable industry ought to be a leading pursuit on the slopes of the Blue Ridge and other mountain ranges of Virginia, where experience has shown that the quantity and quality of the honey produced surpass that of almost any known region. The average production of the United States in 1860 was about two-thirds of a pound to the inhabitant; that was, very nearly, the average of New York, the State producing the largest quantity.

Swine are easily and cheaply raised in all portions of Virginia, especially in the portions abounding in forests, where they subsist much of the year on the nuts of the beech, oak, chestnut, and other trees, at no cost to their owners; in fact they are often fattened entirely on "mast." These animals can be reared more cheaply here than in almost any other part of the country; consequently they are kept in large numbers, and "Virginia bacon" has a valuable reputation in the markets. The climate is credited with aiding in the "cure" of hog meat. The table presents the statistics of swine in Virginia in 1860:

SECTIONS.	Number of Swine.	Number of Swine to each 100 People.
Tidewater.....	345,814	100
Middle	291,902	80
Piedmont	228,101	109
Blue Ridge.....	36,924	150
The Valley	229,358	118
Appalachia.....	130,608	170
TOTAL	1,262,707	Av. 103

At the same period the number to each 100 people was:

In New England.....	10
In Middle States	31
In Western States.....	149
In Southern States.....	175
In Pacific States.....	101
In the United States.	106
In Great Britain, in 1874.....	9 $\frac{1}{2}$
In Norway	5 $\frac{2}{3}$

Virginia had 1-24th of all the swine in the United States. There can be no question but that it would be better for the people and the State to raise sheep rather than swine for animal food.

Stock and Beef Cattle—the "other cattle" of the census—including all horned cattle, except milch cows and working oxen, are reared in large numbers in all parts of Virginia, but especially in Piedmont, the Blue Ridge, the Valley and Appalachia, where stock raising is an important and profitable branch of husbandry. Large numbers of fat cattle are annually sent to the Eastern markets from the rich grass lands of the sections named, especially from the portions where the nutritious and fattening "blue grass" grows. Many young stock cattle are also sold to the farmers of the country near the large cities, where they are stall fed. The table on next page is the return of "other cattle" for Virginia in 1860.

SECTIONS.	Number of Cattle.	Number of Cattle to each 100 People.
Tidewater.....	74,741	21
Middle.....	93,605	25
Piedmont.....	96,764	46
Blue Ridge.....	10,528	43
The Valley.....	95,351	49
Appalachia.....	51,644	67
TOTAL.....	422,643	34 Av.

In Great Britain, in 1874, there were about 15 "other cattle" to each 100 of the inhabitants.

There are vast tracts of mountain land in Virginia that furnish a "range" for young cattle, enabling the grazier to rear them at but little expense. These tracts of land are covered by a growth of timber, more or less heavy, beneath which is an undergrowth of rich-weed, wild grasses, &c., that are highly nutritious, and on which cattle can subsist from April to November. The stock raising capacity of the State can hardly be estimated, so great is it.

Working Oxen are favorite "plow cattle" in many portions of Virginia, experience having proven that they are very efficient for all ordinary farm team labor, while they are valuable for beef after their activity is lost. The figures of the census indicate that in the Valley, where the heavy, limestone clay soil abounds, fewer oxen and more horses are used than where the soils are lighter and looser. Oxen are more numerous, in proportion to the farming population, in Tidewater, than in any other section of the State.

The working oxen in 1860 were distributed as follows:

SECTIONS.	Number of Oxen.	Number of Oxen to each 100 People.
Tidewater.....	28,487	8
Middle.....	27,519	7
Piedmont.....	14,222	6
Blue Ridge.....	1,896	7
The Valley.....	3,378	2
Appalachia.....	3,601	4
TOTAL.....	89,103	7 Av.

The *Cattle used for Human Food*, including milch cows, sheep, swine and "other cattle," already enumerated separately, may be summed up as below :

SECTIONS.	Number of All Kinds.	Number to each 100 People.	Value of Animals Slaughtered.
Tidewater.....	577,913	1.6	2,379,633
Middle.....	629,356	1.7	2,417,580
Piedmont.....	506,077	2.4	2,094,078
Blue Ridge.....	85,373	3.4	199,131
The Valley.....	497,486	2.5	1,734,486
Appalachia.....	290,409	3.9	699,133
TOTALS.....	2,586,047	2.1 Av.	\$9,365,151

The number of animals slaughtered for food of course depends upon the population. This accounts for the large numbers slaughtered in Tidewater, Middle and Piedmont, since in those sections are located the large cities of the State.

The *Scale and Shell Fish* of Virginia furnish not only a large portion of the animal food of thousands of the people of Virginia, especially in the Tidewater country, but immense numbers are taken from the waters of this and shipped to other States.

The thousands of square miles of Virginia territory covered by tidal waters abound, in the proper seasons, in shad, herring, rock, perch, sturgeon, sheepshead, bass, chub, spots, hogfish, trout, tailor, Spanish mackerel and other fish, besides crabs, lobsters, terrapins, &c. Not less than \$1,000,000 worth of the fishes enumerated are annually taken. The fishing season opens early, and while the waters near New York, Philadelphia, and other cities, in a higher latitude, are yet frozen, the shad and other spring fish can be caught in Virginia waters and sent to northern and northwestern markets, where they command high prices. Many of the fresh water streams of the State abound in many kinds of fish, and both the State and the United States authorities are stocking them with other varieties. No country has more or better streams for fish breeding.

Oysters are found in all the tributaries of Chesapeake bay and along the Atlantic coast, giving to Tidewater an extensive territory where this valuable shell fish grows naturally and where it can be propagated and reared in almost any desired quantity. It is estimated that more than 15,000,000 bushels of oysters are annually taken from the beds of Tidewater, valued at from twelve to fifteen million dollars. In 1869 over 5,000 small boats and 1,000 vessels of over five tons burthen, were employed in taking these oysters from the water, and 193 State and 309 other vessels, of 18,876 tons aggregate burthen, were engaged in conveying them to market. It is well known that the published statistics come far short of the actual numbers of

scale and shell fish taken in Virginia. A correspondent of the Richmond Dispatch, in a letter from Chincoteague island, (August 1875), states that there are annually sent from that island—which is 7 miles long and averages $1\frac{1}{2}$ miles in width—to market 500,000 bushels of oysters, “at prices ranging from 65 to 90 cents, while the cost of planting, gathering and marketing does not exceed 30 cents a bushel.” There should be added to the “value of animals slaughtered” from \$15,000,000 to \$20,000,000 for Tidewater, on account of fish of all kinds, swelling the *meat* production of Virginia to the dimensions of that of almost any State of the Union.

Birds for food are abundant, especially water fowl, in the great marshes and rivers of Tidewater, where canvas-back, mallard, creek, red-head, bald-face, teal and other ducks, geese, swans, sora, &c., swarm abundantly. In all portions of the State are found partridges or quails, pigeons, wild doves, grouse or pheasants, wild turkeys, and other game birds.

Wild Deer are found in all portions of the State, especially in Tidewater and the Middle and Mountain sections.

The statistics give Virginia most ample resources of *animal food*, sufficient for a population many times as numerous as she now has. Nowhere is this kind of food better or cheaper.

The *Working Animals* of any country furnish, by their numbers, a test of its agricultural industry. In 1874, there were in Great Britain about $8\frac{1}{2}$, and in France, in 1872, 8 horses to each 100 of the inhabitants. The number in Virginia, in 1860, was $16\frac{1}{2}$ horses to each 100 people. Virginia had, in 1860, of working animals, 330,452, or over 27 to each 100 of the population. The following table gives their distribution in the State :

SECTIONS.	Number of Horses.	Number of Mules and Asses.	Number of Working Oxen.
Tidewater	30,971	15,403	28,487
Middle	46,030	15,784	27,519
Piedmont.....	47,770	4,804	14,222
Blue Ridge.....	4,937	179	1,896
The Valley.....	51,518	1,953	3,378
Appalachia.. ..	19,807	1,318	3,601
TOTALS	201,933	39,441	79,103

This State has always been noted for the general excellence of the horses and mules bred in it, and it is well known that they can be reared cheaply in almost every section. Recently buyers from other States have found it to their interest to attend the sales of stock that usually take place in all the county towns on the monthly court days.

The *Value of the Live Stock* of Virginia, in 1860, was:

SECTIONS.	Value.	To each Person.
Tidewater.....	6,986,612	20 26
Middle.....	9,198,584	24 79
Piedmont.....	7,989,165	38 20
Blue Ridge.....	718,173	29 31
The Valley.....	7,480,675	38 59
Appalachia.....	3,046,660	39 61
	\$35,419,809	\$29 04 Av.

The United States Department of Agriculture, in the Report for 1869, gives the following *Live Stock* statistics for Virginia, as of February 1st, 1870:

	Number.	Average Price.	Value.
Horses.....	220,500	\$ 89 59	\$19,752,390
Mules.....	32,400	114 33	3,704,292
Oxen and other cattle.....	295,000	20 42	6,023,900
Milch Cows.....	240,000	30 04	7,209,600
Sheep.....	557,000	2 58	1,437,000
Swine.....	904,400	5 42	4,991,848
TOTALS.....	2,249,300	.....	\$43,029,030

These are not returns from actual inspections, but they are approximations from reliable sources of information. The increased value over 1860 is very considerable, notwithstanding the great losses to which this kind of property is especially liable during war times.

Price of Farm Stock in Virginia January 1st.*

	1874.	1873.	1872.	1871.	1870.	1869.
Horses.....	\$ 75 92	\$ 81 57	\$ 78 18	\$ 84 93	\$ 89 53	\$ 80 60
Mules.....	103 83	109 30	110 42	103 33	114 33	110 72
Oxen and other Cattle.....	17 20	16 87	17 21	21 24	29 42	20 59
Cows.....	22 00	23 69	24 93	29 09	30 04	28 76
Sheep.....	2 90	3 04	2 70	2 37	2 58	2 40
Swine.....	3 51	3 67	3 53	5 60	5 42	4 39

*Report of U. S. Department of Agriculture, 1873.

The following statement* of the number of horses, mules, asses, jennets, cattle, sheep, goats and hogs (swine), in the State of Virginia in 1874, and their value, is from the official returns of the assessors in the office of the Auditor of the State:

SECTIONS.	HORSES, MULES, ASSES AND JENNETS.		CATTLE.		SHEEP AND GOATS.		HOGS (SWINE).	
	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.
Tidewater.....	38,251	2,276,993	93,549	1,016,865	38,297	73,001	133,919	339,148
Middle.....	48,357	2,828,420	120,725	1,482,907	53,639	120,544	126,914	278,950
Piedmont.....	48,599	2,704,725	121,297	1,632,412	81,750	191,689	105,556	234,035
Blue Ridge.....	6,020	289,938	23,283	249,694	24,581	25,108	29,934	24,426
Valley.....	55,104	3,333,261	126,739	1,804,252	85,902	176,193	113,739	272,368
Appalachia.....	23,663	1,224,275	78,716	837,734	78,488	86,047	65,717	83,818
TOTALS.....	220,909	\$12,712,667	567,289	\$5,963,864	362,627	\$678,582	571,779	\$1,207,695

Silk Cocoons are reported from each section of the State in 1860. Considerable attention was once given to silk culture, and enough is known of the results to warrant the statement that the conditions of the climate are favorable. The mulberry flourishes.

SECTION II.—VEGETABLE PRODUCTIONS.

Virginia has a rich and abundant native flora, and the introduced plants, the cereals, grasses and others, that in temperate climates are objects of cultivation, here have found favorable soils and congenial climates. Here grow and yield abundantly the "plants good for food" both for man and beast, and those employed in manufactures. Timber trees of many kinds abound in all sections of the State.

The *Cereals*, the furnishers of the larger portion of human food, hold the first place among vegetable productions. The following table gives the returns in bushels, of Virginia, in 1859 (census of 1860), of the four most important bread-grain cereals:

SECTIONS.	Wheat.	Rye.	Indian Corn.	Buckwheat.
Tidewater	2,524,435	42,151	9,666,159	703
Middle.....	2,941,641	42,906	7,299,421	13,108
Piedmont.....	2,295,596	186,629	5,823,289	14,381
Blue Ridge.....	117,393	69,476	428,885	28,353
The Valley	2,621,535	272,788	4,973,919	41,646
Appalachia	347,800	56,102	2,169,688	37,358
TOTALS	10,848,400	670,052	30,361,352	135,549

* Furnished by Auditor Wm. F. Taylor, August, 1875.

These cereals aggregate 42,015,253 bushels of production, over 34.4 bushels to each of the population of the State—an abundant supply for seven times as many people. A comparison of the production of cereals with any other country presents Virginia in a most favorable light as a grain-producing region, while nearness to markets adds largely to the value of the products. The yield of these cereals in 1869, per capita, in round numbers, was:

SECTIONS.	BUSHEL OF PRODUCTION TO EACH INHABITANT.		
	Wheat.	Indian Corn.	All Four.
Tidewater.....	7	28	35
Middle.....	8	19 $\frac{2}{3}$	28
Piedmont.....	11	28	40
Blue Ridge.....	4 $\frac{7}{8}$	18	26
The Valley.....	13 $\frac{1}{2}$	25 $\frac{1}{3}$	40 $\frac{2}{3}$
Appalachia.....	4 $\frac{1}{2}$	28 $\frac{2}{3}$	34

Indian corn is the staple bread grain of most sections of the State, except the Valley; the laboring rural population, in many portions, use it almost exclusively.

The United States Department of Agriculture, in its report for 1869, gives the following "*Table of the CROPS of VIRGINIA for 1869*," the results of its estimates gathered from all sources of information:

	Crop of 1869.	Yield per Acre.	Acreage.	Value per Bushel, &c.	Total Value.	Cash Value per Acre.	Average Value per Acre.
Indian Corn—Bushels...	17,500,000	15.5	1,129,032	\$ 0 91	\$15,925,000	\$14 10	\$12 66 in Illinois.
Wheat " ...	8,642,000	10.5	823,047	1 21	10,456,820	12 70	13 02 in Minnesota.
Rye " ...	800,000	9.3	86,021	0 91	728,000	8 46	13 49 in Georgia.
Oats " ...	9,017,000	17.1	527,309	0 48	4,328,160	8 20	13 71 in Wisconsin.
Barley " ...	28,000	17.3	1,618	0 87	24,360	15 05	14 61 in Virginia.
Buckwheat " ...	75,000	10.7	7,009	0 87	65,250	9 30	
Potatoes " ...	1,188,000	50.0	23,760	0 69	819,720	34 50	
Tobacco—Pounds.....	65,000,000	418.0	155,502	10 30 cwt.	6,695,000	43 05	
Hay—Tons.....	220,000	1.46	150,684	15 41 ton.	3,390,200	22 49	
			2,963,982		\$42,432,510	\$14 61 Av.	

The following comparative table presents facts in regard to wheat production which show that Virginia compares favorably with the noted wheat-growing States. Illinois produced the largest and Iowa the next largest crops of the States in 1869. France had the largest wheat crop in the known world in 1872. England, by high

cultivation, has reached an average of 28 bushels to the acre, but has only increased one-fifth of a bushel in one hundred years—still its average surpasses that of any other country:

	Average Pro- duct of Wheat per Acre. BUSHELS.
* California, 1869.....	18.2
Illinois, 1869.....	11.2
Iowa, 1869.....	13.0
United States, 1869.....	13.5
† United States, 1873.....	12.7
France, 1872.....	19.3
Holland, 1872.....	25.3
Austria, 1871.....	15.2
Prussia, 1867.....	17.1
‡ England (average).....	28.0

In 1869* Pennsylvania produced the largest crop of rye, 17.7 bushels, average, per acre, and of buckwheat, 16.4 bushels; Missouri the largest crop of maize, averaging 30.6 bushels to the acre. In 1870† Norway produced 25.9 bushels of rye, and in 1867 Prussia had 16.7 bushels to the acre.

Potatoes, Peas and Beans, or Tubers and Pulse, are raised in considerable quantities in all portions of Virginia. The returns, in bushels, for 1859 (census of 1860), are as follows:

SECTIONS.	POTATOES.		Peas and Beans.
	Irish.	Sweet.	
Tidewater.....	477,036	1,314,377	323,603
Middle.....	321,913	407,283	89,893
Piedmont	312,256	118,669	35,291
Blue Ridge.....	34,238	2,039	1,718
The Valley.....	300,519	23,756	8,177
Appalachia.....	96,930	26,652	24,154
TOTALS.....	1,542,892	1,892,776	482,836

*Department of Agriculture Report, 1869.

†Agricultural returns of Great Britain, 1874.

‡Times, January 11, 1875.

The total potato crop was 3,435,668 bushels, an average of 2.8 to each inhabitant of the State, and over 6 bushels to each in Tidewater, where both sweet* and Irish† potatoes are a staple crop, the former having a high reputation in market for their superior quality. The latter are sent to market very early in the season. Except in the Tidewater section, where market gardening has become a leading industry, potatoes, as a rule, are only raised in Virginia for family consumption; they are not fed to stock, nor, except from Tidewater, sent to distant markets. There is no question but that more use should be made of this prolific and easily raised article of human and animal food. The average potato crop of Holland‡ is 165 bushels to the acre: that of Michigan§ in 1869 was 155 bushels, and of the whole United States 109.5.

Peas and *Beans* are not cultivated in Virginia to the extent they should be when account is taken of the large areas so admirably adapted to their cultivation, so much more so than to the production of maize, that requires a strong soil, which it rapidly exhausts. Only in Tidewater and parts of Middle Virginia are peas and beans farm products. In European States, large crops of pulse are raised; the average yield in Holland‡ is 25.9 bushels to the acre.

The production of cereals, tubers and pulse, in Virginia, in 1859, was about forty-six million bushels, or 38.25 bushels to each of its inhabitants—enough for seven or eight times as many people.

Oats and *Barley*, cereals not used here for human food, are important Virginia crops, especially the former. Barley is only cultivated to a limited extent, though it always does well, and it could be most advantageously grown for exportation, since the climate would give it *generally* the quality it has only in *occasional* seasons in England, when it bears a high price. The productions of 1859 (1860 census), in bushels, were:

SECTIONS.	Oats.	Barley.
Tidewater.....	1,524,466	172
Middle.....	3,047,548	834
Piedmont	1,739,159	767
Blue Ridge.....	262,544	282
The Valley.....	1,372,823	6,012
Appalachia.....	591,090	430
TOTALS	8,537,630	8,497

The Middle country led in the production of oats, and was followed by Piedmont. The friable soils and early seasons of the lower country are well suited to

* *Convolvulus batatas*—the “long potato.”

† *Solanum tuberosum*—the “round potato.”

‡ Agricultural returns of Great Britain, 1874.

§ Department of Agriculture Report, 1869.

the growth of this crop. In 1869, by report of the Department of Agriculture, the average product per acre, in Virginia, of oats, was 17.1, and of barley, 17.3 bushels. In France, in 1872, the average for oats was 28.2, and for barley 21.5 bushels per acre.

The *entire crop* of cereals, tubers and pulse, of Virginia, in 1859, was more than 54 million bushels, over 45.3 bushels for each inhabitant.

The *Production of Wheat and Indian Corn* in bushels, per capita, in the various sections of the United States, by the returns of 1860, was :

SECTIONS.	Wheat.	Maize.
New England.....	0.34	2.92
Middle States.....	3.69	9.12
Western States.....	10.00	45.86
Southern States.....	3.50	31.49
United States.....	5.50	26.73

A comparison of the figures here given with those before presented for the sections of Virginia, shows that the Valley and Piedmont excelled any of the groups of States in the production of wheat per capita, while Middle and Tidewater were only surpassed by the Western States. Every portion of Virginia produced more than the great wheat growing Middle States. In the production of Indian corn nearly all sections of Virginia produced more than the average for the United States.

The *Products of Orchards and Market Gardens* in Virginia are large and valuable, much more so than is indicated by the returns of the census. Every portion of the State is remarkably well adapted to the growth of fruits of the warm-temperate and temperate climates.

The following table is from the census of 1860, but it must be regarded as *merely an approximation* to the value of the products of the orchards and market gardens of Virginia :

SECTIONS.	VALUE OF PRODUCTS OF	
	Orchards.	Market Gardens.
Tidewater.....	198,956	455,127
Middle.....	57,791	66,503
Piedmont.....	112,291	11,416
Blue Ridge.....	30,664	2,406
The Valley.....	113,595	4,321
Appalachia.....	53,080	695
TOTALS.....	\$566,377	\$540,468

In Tidewater Virginia apples, pears, peaches, quinces, plums, cherries, nectarines, grapes, figs, strawberries, raspberries, gooseberries, currants, and other fruits, thrive and produce abundantly, the quality of the products being unsurpassed, as the awards of the American Pomological Society attest. The value of the *small fruits* alone, annually sent to market from Tidewater, is more than the sums for orchards and gardens above given. The trade in early strawberries is one of large proportions. Especial mention should be made of the wild Scuppernong grapes, peculiar to the Tidewater country near the sea, which spread over the forests and bear large crops of excellent fruit, from which a very palatable wine is made. The originals of the Catawba, Norton's Virginia, and other esteemed American grapes, grow wild in the forests of Virginia.

All the fruits named above grow in every section of the State, except, perhaps, figs. Piedmont, the Blue Ridge and The Valley are famous apple regions. Peaches flourish in all sections, but Middle and Tidewater may claim some precedence in adaptability. The Blue Ridge is entitled to the name of the "Fruit Belt," and its extensive area is yet to become the most noted wine and fruit producing section of the United States east of the Rocky Mountains; all the fruits of Virginia flourish there in a remarkable manner, and find special adaptations of soil, climate and exposure.

The *Market Gardens* of Tidewater shipped* from Norfolk alone, to other markets, in the spring of 1870, a million baskets of strawberries, 50,000 barrels of Irish potatoes, 40,000 barrels of green peas, 10,000 barrels of snap beans, 650,000 heads of cabbage, 20,000 barrels of cucumbers, 160,000 barrels of tomatoes, 5,000 barrels of squashes, 2,000 barrels of beets, 40,000 bunches of radishes, 100,000 cantelope melons, and 100,000 watermelons, valued at \$1,043,000. This does not include \$25,000 worth of apples, pears, peaches, &c., shipped during the same season. The shipments of 1872 were valued at \$1,500,000. Shipments were made from *many other* places. This business is called "trucking." The products of the "truck patches," or market gardens of Tidewater, are mostly marketed from March to August.

No country can be better situated for market gardening than Tidewater Virginia:—it is from 14 to 36 hours, by water, from Baltimore, Washington, Philadelphia, New York and Boston, the centres of population of the Atlantic slope of the United States; at the same time its seasons are from one to two months earlier, giving an advantage of fully a double price for its garden products over the country in the vicinity of those cities.

The *Home Gardens* are not considered in any of the "returns" of the productions of Virginia, where potatoes, Irish and sweet, corn, peas, beans, onions, beets, parsnips, radishes, lettuce, celery, salsify, asparagus, melons and squashes of numerous kinds, carrots, okra, tomatoes, &c., &c., are raised in the greatest abundance, and form a portion of the daily food of the entire population.

The *Peanut* (*Arachis hypogæa*) is extensively cultivated in Tidewater. Isle of Wight county, it is reported, in 1872, sent 40,000 bushels to market, that sold for

*Estimates of Pomological Society.

\$1.50 to \$3 a bushel. In 1871-'2 there were received at Norfolk 351,120 bushels* of these *ground-nuts*. Sandy and light soils are suited to the growth of peanuts.

Vegetable Sweets are produced in Virginia from the sugar maple (*Acer saccharinum*), and the Chinese sugar cane (*Sorghum saccharatum*). The production from these sources was, in 1859:

SECTIONS.	MAPLE—		Sorghum Molasses. Gallons.
	Sugar. Pounds.	Molasses. Gallons.	
Tidewater.....	.....	192	50
Middle.....	.....	286	201
Piedmont.....	352	178	213
Blue Ridge.....	20	752	144
The Valley.....	54,132	9,711	21,021
Appalachia.....	216,657	16,805	24,805
TOTALS.....	271,161	27,924	46,434

Sorghum flourishes in strong soils in all portions of the State, and the production of molasses from this source is from eight to ten times the quantity here given. The objection to its cultivation is that it matures simultaneously with Indian corn, and both crops demand attention at the same time. The sugar maple, or "sugar tree," as it is familiarly called, abounds on the rich lands of the mountain regions, and there, every spring, much larger quantities of delicious tree sugar and molasses are made than the State obtains credit for. This manufacture is an extensive and profitable one in many of the States, and could be made so here.

Beet Root Sugar ought to be made in Virginia in large quantities, as it has an abundance of rich bottom lands for growing the beets, and seasons highly favorable for the development of saccharine matter in them. In France, in 1872, more than 221 million hundred-weights of beets were raised for sugar; they occupied 856,176 acres of land—a quantity equal to that occupied by wheat in Virginia in 1869.

The *Wine* crop of Virginia is a small one compared with the extensive territory here found that is especially adapted to the growth of the vine both by the character of the soil and the conditions of the climate. Fully two million acres of land in Virginia have soils and exposures similar to those of the most noted wine producing sections of Europe, and the seasons are so long that the grape has ample time to fully mature and develop its natural juices, fitting them for the manufacture of pure wine. Experience has shown that the vines here grown are free from diseases, and that they may be relied on for abundant crops. The yield for 1859 is given on succeeding page; it was more than the figures indicate.

SECTIONS.	Wine. Gallons.
Tidewater.....	6,398
Middle.....	20,641
Piedmont.....	6,608
Blue Ridge.....	92
The Valley.....	4,562
Appalachia.....	139
TOTAL.....	38,440

The BLUE RIDGE offers great advantages for viticulture: one vineyard on it, in Warren county, of 75 acres, produces from 20 to 30,000 gallons of wine and from 6 to 10,000 gallons of brandy annually, the yield being from 300 to 500 gallons per acre. The "red lands" of the PIEDMONT section are famous for their fitness for this pleasant and profitable industry. There are many localities in the other sections of the State where the vine flourishes. Early grapes are sent in considerable quantities from Virginia to northern and eastern markets. Mention has been made of the Scuppernong grape of Tidewater, marvellous for the space a single vine will cover and the quantity of fruit and wine it will produce. There is no more inviting field for the vigneron than Virginia. France had in 1872 under cultivation in vines 6,455,627 acres, an area nearly equal to all of Tidewater, larger than the Valley and Blue Ridge combined. Virginia should have as many acres, because it has equal advantages, naturally, in every particular, combined with a virgin soil, in its "fruit belt." The value of the *plain* wines made in France averages \$500,000,000 in gold annually; the average yield is 220 gallons per acre, and for the last 16 years the product has averaged 1,100,000,000 gallons yearly.*

Tobacco is a staple product of Virginia, and in 1859 it produced about one-third of the crop of the United States, being the leading State in production, making about 100 pounds to each of its inhabitants. The crop of the sections for that year is shown in the table:

SECTIONS.	Tobacco. Pounds.
Tidewater.....	8,893,092
Middle.....	84,333,419
Piedmont.....	24,148,461
Blue Ridge.....	450,449
The Valley.....	3,657,921
Appalachia.....	304,304
TOTAL.....	121,787,646

* London Times.

Middle Virginia produced 84½ million pounds, 228 to each of its population, figures attesting the industry of its people, because no cultivated crop requires as much care and labor to bring it to market in good condition.

The "Virginia Leaf" is noted the world over for its excellence, the result of manipulation as well as of soil and climate. *Piedmont* produced 120 pounds to the head. The soils of this and the *Middle* section are among the best for the growth of good tobacco; those of *Middle* produce the finest and most valuable. *Tidewater* is the region for Cuba and Latukiah varieties, while immense crops of coarse and heavy tobaccos are grown on the rich lands of the Blue Ridge, the Valley and Appalachia. Some idea may be formed of the value of this great staple, when it is stated that more than 20,000,000* pounds were manufactured in Richmond alone in 1872, employing the labor of 11,049 hands. The United States tax, collected on Virginia tobacco in 1869-'70† was \$4,068,220, or one-seventh of that paid for the whole Union.

The price of tobacco in Richmond in June, 1870, was from \$7 to \$35 per 100 pounds for "lugs," and from \$8.50 to \$100 for "leaf," according to quality.

In 1869 Richmond exported tobacco as follows:

To Bremen.....	124.184 pounds of "leaf,"
" "	550.813 " "stems,"
" Havre.....	2,433.278 " "leaf,"
" Trieste	1,333.000 " "
" Fiume	686.000 " "
" London.....	1,591.163 " "
" Liverpool.....	1,571.697 " "
" Halifax.....	217.817 " "
	<hr/> 8,552,862

It has been found that no known country can compete with Virginia in the growth and manufacture of the better kinds of "the weed:"—her soil and climate are "just right" for it.

It should be noted that tobacco culture is not an exclusive one in any part of Virginia—large crops of grain and roots are raised on the same plantations.

Grass is one of the abundant productions of Virginia, much of its territory being inside the limits of "natural grasses," and all of it is adapted to the vigorous growth of the "artificial" or cultivated ones, but the character of its climate does not require a large stowing away of hay, therefore it does not "figure" largely in the returns. A reference to the number of cattle in each section of the State makes the quantity of hay produced appear very small in proportion, but it shows that the pastures can be relied on for most of the year, owing to the mildness of the climate, greatly to the advantage of the stock feeder. It is true that a large quantity of long forage is obtained from the "tops, blades and stalks" of Indian corn, which, where this is a staple crop, take the place of hay for home consumption, and leave the hay for market, if desired.

* State Journal.

† Report of Richmond Chamber of Commerce.

The *Seeds of Clover, Grass and Flax* naturally claim attention along with grass, and the table shows the sectional production of these articles in Virginia for 1859:

SECTIONS.	Hay. Tons.	SEEDS.—BUSHELS.		
		Clover.	Grass.	Flax.
Tidewater.	45,246	186	298	496
Middle	49,689	783	3,104	1,528
Piedmont.	58,945	4,906	10,439	7,331
Blue Ridge.	8,553	301	867	2,917
The Valley.....	104,955	22,652	23,626	7,140
Appalachia.....	18,609	904	458	4,859
TOTALS.....	285,997	29,732	38,792	24,277

Fine crops of hay are made from cultivated grasses in all portions of the State, but the *natural* meadows are mostly in **PIEDMONT, BLUE RIDGE, THE VALLEY** and **APPALACHIA**. The "Hay Map" of the Statistical Atlas of the United States shades these sections the same as it does most of Pennsylvania, West Virginia, Ohio, Indiana, Illinois, Missouri, &c., and as more productive than most of Tennessee and Kentucky. The Report of the Department of Agriculture for 1869 gives, as the average production of hay in Virginia, 1.46 tons per acre, worth \$22.49, a larger yield than any of the New England States, and almost equal to the 1.54 of New York, the leading hay State, and worth more, its value being \$19.49 per ton.

The perennial grasses of **PIEDMONT, the BLUE RIDGE, THE VALLEY** and **APPALACHIA**, including the noted "blue grass," are famed for their nutritious and fattening qualities, and place these among the most highly favored grazing regions in the world. Nowhere, save on the great plains of Texas and the extreme West, or South America, can cattle be reared and fattened more cheaply than in these sections of Virginia, as has been proven by the investigations of the United States Department of Agriculture. The **VALLEY** leads in the production of hay and seeds: **PIEDMONT** follows. The meadows of the *low country* in Virginia have an advantage in the early "haying" time, and where not too remote from the great cities, much profit can be gained by being early in market. *Tidewater* and *Middle* Virginia have many fine alluvial meadows, and the *salt marshes* of the former yield fine crops of hay, and perpetual pastures.

The crops of clover and grass seeds are unusually large where they are made an object; the long seasons seem to give a larger yield of good seed. The first crop of clover, for the year, is generally cut for hay, it has so large a growth, and seed is taken from the less rank second growth.

Flax grows well in all portions of Virginia, though little attention is now given to its cultivation. The elevated mountain valleys suit it admirably.

Castor Beans (*Ricinus communis*) are raised in considerable quantities, especially on the Eastern Shore of TIDEWATER.

The raising of *Garden Seeds* upon a large scale has lately been introduced in TIDEWATER, the climate and soil of which appear to be very favorable to this industry. The seeds grown have given much satisfaction, as they are sure to be ripe. England annually obtains many of her seeds from Italy and other warmer climates.

The warm thin lands of TIDEWATER and the MIDDLE country offer many advantages for growing *Garden Herbs* and *Perfumery Plants* and *Shrubs* on an extensive scale—the requisite heat and dryness of climate can there be found.

Hops are only raised for domestic use, except in a few cases. When planted the vines grow luxuriantly and bear well. The returns were :

SECTIONS.	Hops. Pounds.
Tidewater.....	1,294
Middle.....	1,776
Piedmont.....	1,310
Blue Ridge.....	163
The Valley.....	2,284
Appalachia.....	179
TOTAL.....	7,006

Large areas of land, similar to the hop lands of Kent, in England, and to those of the State of New York, can be found in Virginia, and hop culture could be advantageously undertaken in many localities, to vary the industrial productions.

*Ramie** and *Jute*, most valuable textile plants, could, without doubt, be most advantageously and successfully cultivated on the deep and rich *second bottoms* and *reclaimed swamp* lands of Tidewater. Ramie is a perennial, and the stalks are cut three or four times in a year, and the crude ramie-staple is worth from £65 to £70 a ton in Europe, and more in America. Millions of bales of jute are now annually consumed in the manufacture of paper, gunny-bags, grain sacks, &c.

Cotton, *Flax* and *Hemp*, the vegetable textile or fibrous products, are grown in Virginia successfully and profitably, but by no means as extensively as circumstances would seem to warrant. *Cotton* is somewhat largely cultivated in portions of TIDEWATER, especially south of the James, in the Southside Peninsula, where the climatic† conditions are favorable. A planter in Greensville county, in 1873, averaged two 400 pound bales to the acre, and others report equally gratifying results. Virginia has these 1860 census credits for 1859 production, in pounds :

* See Report of Department of Agriculture (U. S.) 1873.

† See chapter on Climates.

SECTIONS.	Cotton.	Hemp.	Flax.
Tidewater	4,104,800	10	5,454
Middle	850,400	148	33,357
Piedmont .....	.....	15,961	60,003
Blue Ridge	4,000	653	31,907
The Valley	83,600	11,060	69,838
Appalachia	12,000	210	90,051
TOTALS	5,054,800	28,042	290,610

A usually well informed writer* estimated the cotton crop of Virginia for 1871-'2 as 110,439,200 pounds (341,080 bales), and for 1872-'3 as 173,433,200 pounds (433,583 bales). These differ widely from other estimates, but no explanation can be made from existing data.

The Report of the Bureau of Statistics of the United States Treasury, for September, 1874, page 128, gives the following statements :

	1869-'70.	1870-'71.	1871-'72.	1872-'73.	1873-'74.
Product of Bales of Cotton in Virginia	203,981	339,175	276,093	433,583	535,876
Total Crop of the United States	3,114,592	4,347,006	2,974,351	3,930,508	4,170,388
Manufactured at the South	79,843	91,240	120,000	279,162	365,093

These figures convey a wrong impression—they can only mean that the number of bales credited to Virginia found their way to market *through* her ports, else she would be the third State in cotton production. The cultivation of cotton on small farms has of late been very successful, and the fine prices realized from the better cotton so raised has greatly stimulated production.

Cotton Seeds have recently become articles of commerce, and they are in demand in Great Britain and elsewhere for the oil they contain and for food for cattle, giving an additional value to the cotton crop. The seeds were worth† in 1873, in Liverpool, \$40 a ton. They also make a most excellent manure. The production of cotton is one of the elements in a mixed husbandry (*the only one that can thrive in a thinly peopled region*), that should be fostered, especially in Tidewater.

Hemp is not a staple of Virginia, and yet there are many rich, moist, bottom lands that could not be put to a more profitable use than the growing of this plant.

Flax, as before stated, is grown for "domestic manufacture" only—a crop now and then supplies the home demand, so luxuriantly does it grow. The fibre of

* E. de Leon, Harpers' Magazine, January, 1874, who states that Virginia produced as given above.

† de Leon—supra.

Virginia flax is of a superior quality, and the climatic conditions, especially of the elevated valleys, are favorable for fitting the crop for market. Flax is cultivated in all sections of the State, but the quantity produced increases in going westward. Virginia produced one-seventeenth of the flax crop of the United States in 1860, and one-twenty-fourth of the flax seed.

The Products of the Forests of Virginia are large, varied and important, but it is difficult to establish quantities and values; so meagre are the published statistics, only local returns can be given.

The Statistical Atlas of the United States, published by order of Congress, (1874), contains a "*Woodland*" map, showing by five degrees of density of shading the forest distribution of the country. On this map Virginia is represented as having a portion of four classes. The northeast of Piedmont, near Washington and Alexandria, is shaded in the second class, as having from 40 to 120 acres of woodland to the square mile of 640 acres, an average of one-eighth of the surface. All of the Valley northeast of Augusta county and the portions of Piedmont, Middle and Tidewater northeast of and including the Rappahannock valley, the Eastern Shore, the basin of the James to Piedmont, the north part of the Norfolk peninsula, the valley of the Dan from the North Carolina line to Danville, and an extensive region around Lynchburg, are in the third class, having from 120 to 240 acres of forest to the square mile, or over one-fourth of the whole surface. The Valley from Rockingham to the New river "divide," Piedmont southwest of the Rappahannock basin, all the portions of Middle and Tidewater not mentioned before, and the southwest corner of the State, except the extreme southeast of the State on the waters of Albemarle sound, are in the fourth class, having from 240 to 360 acres to the square mile, or about one half of the country in woods. The Blue Ridge from the North Carolina line, and the Valley to Roanoke county, and all the Appalachian region, except the drainage ground of the Big Sandy and the North Fork of Clinch, are placed in the fifth class, having from 360 to 560 acres of forest to the 640, or over two-thirds of the whole surface. The Big Sandy and North Fork of Clinch basins, and a belt along the North Carolina line, from the Atlantic to the Roanoke, including the Dismal Swamp, are embraced in the sixth, or highest class, having 560 or more acres of forest to the square mile. These areas are determined from the returns of cleared land of the census, and may be accepted as fair generalizations; though they fail to give much idea of the *timber* resources of the State, still the general presentation puts Virginia among the most highly favored in woodlands.

In the memoir, by Prof. Brewer, of New Haven, accompanying the "*Woodland Map*," Virginia is placed, geographically, among the Middle States, which are stated to have from "100 to 105 species of trees, 65 to 67 of which sometimes reach 50 feet in height. The region was originally entirely wooded, over much of it the forests were very heavy, and there are still immense quantities of timber available. The forests of this region are usually made up of quite a number of species, in some places the broad-leaved species predominating, in others the Coniferæ; but both kinds commonly grow together." Of the Appalachian forests Prof. Brewer says: "While the hard woods may not attain their greatest size, some of them, particularly white oak, white ash, and some of the hickories, are believed to attain

their greatest perfection as regards strength and durability, or, at least, they are only equalled by the timber of the same species extended on the line of these ridges beyond this district in both directions. This is a matter of great importance in ship and boat building, and in the manufacture of railroad cars and of agricultural implements." "It is believed that the white oak attains its greatest development of strength in certain parts of Virginia and West Virginia."

Prof. Brewer remarks that we have above 300 species of native trees, 132, according to Gray, north of the Carolinas, while Central Europe has but about 60, France from 30 to 34, and Great Britain 29, only 15 of which become large trees.

The Richmond Chamber of Commerce reported that for the third quarter of 1868 there were officially measured, in that city, 2,331,542 feet, board measure, of lumber. This would give an annual trade of 9½ million feet, worth over \$200,000. There were received* into the Richmond dock, during the year ending September 30th, 1871, 5,005,000 feet of lumber, 1,272,000 shingles, 338,616 staves, and 30,000 railroad ties. For 1871-'2 the receipts in the dock were 6,771,000 feet of lumber, 2,572,000 shingles, 371,700 hoop poles, &c. These would be but a portion of the total receipts.

The *bark* trade of Richmond for 1868 was valued at \$100,000, and for 1871 at \$750,000. This was chiefly oak bark, for tanning and dyeing purposes, of which this State has an almost inexhaustible supply that must before long be in demand at good prices, as the hemlock forests of the United States, the chief source of tan bark now, are being rapidly cut down. As an illustration of the value of tan bark, it may be stated that 100† tanneries, at Siegen, in Germany, are supplied with bark from oak *bushes*, cultivated for the purpose, that furnished 80,000 tons of bark in 1868 (averaging seven shillings and sixpence per hundred weight in value), with which 100,000 hides were manufactured into 32,000 hundred weight of sole leather having a great reputation for durability.

The sales‡ of lumber in Norfolk for the year 1871-'2 were over six million oak staves, forty-five million shingles, forty-seven million feet of sawed lumber, worth not less than \$2,000,000.

The *Sumac* trade of Virginia is becoming a very important one from the wild shrubs. In 1870, over 1,900 tons of sumac, ground and crude, were shipped from Richmond, valued at over two and a half million dollars. In 1870 a mill at Winchester ground 800 tons of sumac, valued at \$75,000. Analysis, made in Liverpool, gave twenty-seven per cent. of tannin in the Winchester sumac, and the article ranked high commercially. There are extensive areas in all parts of Virginia that could be profitably devoted to the cultivation of sumac, as in Sicily.

Sassafras roots are consumed by hundreds of tons in the manufacture of oil. This shrub, often tree in Virginia, grows abundantly in many sections of the State.

Medicinal roots, as ginseng, snake root, sarsaparilla, mandrake, &c., are gathered in large quantities in the mountains for exportation.

The products of the forests of Virginia, for the year 1869-'70 were worth from

*Richmond Dispatch. January 1st, 1873.

†British Blue Book—1869.

‡Report of Merchants and Mechanics Exchange.

20 to \$25,000,000. They were shipped from hundreds of points, and but a small portion of the trade passed through Richmond and Norfolk.

TIDEWATER has extensive forests of pine (the noted yellow Virginia), oak, cypress, cedar, locust, &c., from which large quantities of sawed lumber and timber, staves, heading, hoop-poles, shingles, railway ties, fire wood, &c., are constantly shipped, very often from the edges of the forests, since sailing vessels can penetrate all portions of the section—directly to all the seaboard markets of the country. Sumac is here an abundant shrub.

The MIDDLE SECTION has large areas of superior hard pine, black, white and other oaks, hickory, locust, persimmon, gum, cedar, holly, and other trees, from which much excellent lumber, tan bark, &c., are sent over the railways and canals that penetrate and cross it to various markets. Sassafras and sumac are plentiful, and the former could advantageously be made a staple crop on the ridge lands.

PIEDMONT has considerable forest land with many varieties of oak, hickory, tulip-poplar, black walnut, locust, cedar, chestnut, pine, and other timber trees, but it can hardly be considered a source of supply for timber for exportation, save in a few localities. Sumac and sassafras abound.

The BLUE RIDGE is mostly covered with forests of oak, white, black, red, rock, &c., hickory, chestnut, locust, birch, some excellent yellow pines, and other trees. This section has furnished great quantities of charcoal for the manufacture of iron from the ores of its western margin, and it will long be a source of supply, so rapidly do its forests renew themselves. The timber supply of pine and other woods for the eastern part of the Valley is drawn from the Blue Ridge. Here is found much valuable hard wood, as hickory and oak for wagon and agricultural implement making. This is yet to become a most important source of supply for oak tanbark to convert into quercitron for exportation, or to be used in the country for tanning. Almost any quantity of oak bark can be obtained from this extensive range.

THE VALLEY has nearly half its surface covered by a growth of oaks, hickories and locusts, interspersed with black and white walnuts, yellow and other pines, all having a uniform age of 150 to 200 years. This timber, while not the largest, is of the very best quality, and no well settled portion of the Union can offer a larger quantity of timber suitable for wagon, carriage, railroad car, cabinet and other work, for which hard, sound and durable woods are required. The slaty lands abound in sumac.

APPALACHIA is both *rich* and *poor* in forestal wealth. On the sandstone mountain ranges, and in the slate and shale valleys, the trees are small but the growth is dense, consisting of oaks and other hard woods, pines, &c., good for charcoal, with larger trees in the hollows and more fertile spots. On the limestone ridges and adjacent valleys, as also in the calcareous and some shale valleys, on the other hand, the oaks, walnuts, white and yellow tulip-poplars, birches, beeches, locusts, cherries, sycamores, and other timber trees, are found of a sound growth and very large size, often several feet in diameter, straight and without a limb for fifty to eighty feet from the ground. Only portions of this region have been reached by railroads, and extensive forests of the best of timber for nearly all purposes await the progress of internal improvements and future demands. There are some ex-

tensive forests of white pine and of the more common varieties of the fir tribe, but generally the Conifereæ, suitable for timber, are not abundant in the forests of this section. It is fortunate that there is so much excellent coaling timber here in the vicinity of large deposits of the easily fused ores of iron. It is from these mountain forests that ginseng, snake root, sarsaparilla and other medicinal plants are obtained.

Forest Fruits, such as blackberries, whortleberries, cranberries, strawberries, dewberries, haws, persimmons, service berries, thorn and crab apples, wild plums and cherries, are found in boundless abundance in nearly all the unoccupied lands and in the forests of Virginia, where, in their season, they may be had for the picking by any one that is inclined to gather them. Not only are thousands of bushels of these wild fruits annually gathered for home use and sale in home markets, but they are dried or canned for exportation, furnishing important and valuable articles of commerce.

Nuts are found in all sections, embracing chestnuts, chinquapins, black walnuts, white walnuts or butter nuts, hickory nuts of several kinds, hazel nuts, beech nuts, acorns of many varieties, &c.

CHAPTER V. MANUFACTURES.

SECTION I.—RESULTS OF MANUFACTURING IN VIRGINIA.

In *Home Manufactures*, the results of the hand spinning wheel and loom, Virginia has always held a prominent position, a large portion of her rural population having an honest pride in the wearing of home-made clothing. The farmers and planters of all sections of the State were careful to have annual crops of the best flax and wool, and in some sections cotton, to be manufactured at home, not only for the wants of the family, but also for sale. The census of 1860 gives the following returns for the value of Virginia home manufactures:

SECTIONS.	Value.
Tidewater.....	149,403
Middle.....	332,779
Piedmont.....	163,507
Blue Ridge.....	62,010
The Valley.....	106,563
Appalachia.....	162,618
TOTAL.....	\$1,071,885

In proportion to population the sections stood, in the value of home manufactures, 1st Appalachia, 2d Blue Ridge, 3d Valley, 4th Middle, 5th Piedmont, and 6th Tidewater.

In *Manufactures* of various kinds, as *special branches* of industry, but a small portion* of the population of Virginia has engaged, and generally only to supply neighborhood demands.

The aggregate results were as follows in 1860:

SECTIONS.	Number of Establishments.	Capital Invested.	Cost of Raw Material.	Number of Hands Employed.		Annual Cost of Labor.	Annual Value of Products.
				Male.	Female.		
Tidewater.....	966	\$6,096,490	\$9,480,391	9,908	277	\$2,555,863	\$16,019,301
Middle.....	1,233	7,442,934	9,571,826	10,170	2,480	2,630,692	15,655,012
Piedmont.....	688	2,091,452	2,761,759	2,674	321	545,533	4,010,433
Blue Ridge.....	62	157,515	124,741	170	.....	37,644	198,457
Valley.....	1,220	3,560,191	3,316,550	3,599	120	863,214	5,303,216
Appalachia.....	122	230,063	292,893	215	.....	55,720	421,091
TOTALS.....	4,291	\$19,558,645	\$25,548,070	26,727	3,193	\$6,693,536	\$41,637,999

* Less than 12 per cent. in 1870, while nearly 22 per cent. of the population of the U. S. were so engaged.

Comparing the totals here given with those for the entire United States, it appears that Virginia had, in round numbers, 1-35th of the manufacturing establishments, 1-50th of the invested capital, paid 1-40th of the cost of raw material used, employed 1-39th of the male and 1-90th of the female hands, paid 1-54th of the cost of labor, and the annual value of its products was 1-45th of the whole—a result highly creditable to the State.

The following tables present the details of manufacturing in each section, which, added, form the totals above given.

The Tidewater counties in 1860 were returned as having the following totals of the results of manufacturing:

COUNTIES.*	Number of Es- tablishments.	Capital Invested.	Cost of Raw Material.	Number of Hands Employed.		Annual Cost of Labor.	Annual Value of Products.
				Male.	Female.		
Accomac	17	\$ 3,465	\$ 9,269	47	4	\$ 13,812	\$ 29,385
Caroline	23	76,875	132,423	85	3	17,064	202,600
Charles City	15	33,550	56,890	45	....	10,788	114,100
Elizabeth City	26	16,625	30,335	57	....	12,429	56,922
Essex	5	8,900	3,000	23	....	7,260	16,400
Gloucester	40	92,995	104,632	152	5	21,120	156,323
Hanover	27	40,700	63,507	64	....	16,896	101,025
Henrico	320	4,637,030	7,515,431	7,413	171	2,002,812	12,926,243
Isle of Wight	9	88,400	44,200	88	40	19,368	90,590
James City	29	75,425	99,057	89	4	22,524	157,693
King George	30	34,160	53,193	145	....	9,104	69,430
King & Queen	21	43,900	63,472	37	....	7,916	87,460
King William	24	73,000	85,035	59	....	16,044	121,675
Lancaster	14	37,050	64,650	45	....	7,374	84,040
Mathews	11	28,500	38,517	20	....	4,330	50,195
Nansemond	8	20,100	61,000	23	....	5,140	81,500
New Kent	18	46,460	53,320	48	1	8,906	104,402
Norfolk	86	397,277	299,764	644	33	193,621	732,941
Northampton	6	10,750	10,920	40	....	6,150	25,510
Northumberland	19	41,000	64,374	41	....	7,456	90,732
Prince George	3	32,000	15,500	42	4	8,338	35,460
Princess Anne	14	2,950	11,350	26	....	5,760	20,750
Richmond	2	1,500	3,000	15	....	4,500	9,000
Southampton	20	9,361	5,630	45	....	10,854	21,140
Surry	10	42,465	43,649	83	4	15,876	97,515
Sussex	39	89,300	116,425	96	2	18,597	132,535
Warwick	5	20,500	61,688	31	....	10,200	132,856
Westmoreland	2	2,200	1,710	9	....	2,830	5,600
York	118	90,052	58,270	356	....	65,563	218,697
TOTAL	935	\$6,096,490	\$9,480,391	9,903	277	\$2,555,868	\$16,019,501

* There were no returns from Middlesex.

The manufacturing centres of Tidewater are: 1st, Henrico, including the city of Richmond at the lower falls of the James, *where three-fourths of the manufacturing of the section is done*; 2d, Norfolk, including the cities of Norfolk and Portsmouth; 3d, York, and 4th, Caroline counties. Most of the manufacturing of this section is done in and near Richmond and Norfolk.

The following table gives the details of manufacturing in Tidewater in 1860:

KIND.	Number of Es- tablishments.	Capital Invested.	Cost of Raw Materials.	Number of Hands Employed.		Annual Cost of Labor.	Annual Value of Products.
				Male.	Female.		
Agricultural implements.....	12	\$ 82,400	\$ 33,860	162	....	\$ 57,660	\$ 188,100
Blacksmithing.....	48	17,646	33,374	120	....	33,468	87,567
Book-binding and blank books.....	3	4,500	5,200	13	3	5,520	14,000
Boots and shoes.....	49	60,015	77,980	208	25	67,752	211,380
Boxes—tobacco.....	6	5,500	23,597	56	....	19,200	54,180
Brass founding.....	1	8,400	325	3	....	1,200	2,000
Bread, crackers, &c.....	6	7,000	83,675	62	6	24,660	133,000
Brick.....	21	103,750	58,583	336	5	31,788	149,500
Carpentering.....	29	52,750	86,345	182	....	64,428	278,640
Carriages.....	47	114,375	95,459	404	5	119,192	343,010
Cars.....	1	37,000	39,150	45	....	20,244	75,000
Cigars.....	9	13,200	17,220	37	....	13,872	50,300
Chemicals.....	1	6,000	4,000	....	3	1,080	8,000
Clothing—ladies' cloaks, &c.....	1	150	500	....	5	1,200	2,330
Clothing—ladies' hoop-skirts.....	1	350	1,500	....	15	2,400	4,670
Clothing—men's.....	21	47,250	70,050	39	100	34,452	133,000
Coal—bituminous.....	1	100,000	5,700	80	....	19,200	47,000
Confectionery.....	15	3,300	18,985	13	....	3,756	26,050
Cooperage.....	13	37,650	111,550	263	....	80,505	232,850
Copper-smithing.....	1	14,000	2,650	10	....	4,200	9,000
Cordage.....	1	500	3,000	6	....	900	5,000
Coffins.....	2	800	700	4	....	1,080	2,660
Cotton goods.....	2	55,000	38,000	40	40	12,000	62,795
Cotton ginning.....	1	1,000	1,000	2	....	360	1,900
Fire-arms.....	2	1,500	1,000	8	....	2,520	5,000
Fisheries—shad, &c.....	116	63,142	24,224	481	....	50,484	104,157
Fisheries—oyster.....	25	40,850	26,590	124	....	13,140	53,135
Flour and meal.....	192	1,415,750	3,655,518	501	....	130,396	4,217,342
Furniture—cabinet.....	8	40,950	50,250	67	....	23,784	103,490
Gas.....	1	83,000	2,295	3	....	1,296	12,000
Hardware—coach and saddlery.....	1	800	920	4	....	2,160	7,000
Hardware—files.....	1	1,200	2,070	10	....	1,200	4,000
Hardware—locks, &c.....	2	3,500	1,950	9	....	3,960	8,000
Hats and caps.....	4	5,500	11,900	12	1	7,536	28,200
Iron—bar, sheet and railroad.....	1	425,000	411,775	800	....	307,200	1,000,000

TABLE OF MANUFACTURES CONTINUED.

KIND.	Number of Es- tablishments.	Capital Invested.	Cost of Raw Materials.	Number of Hands Employed.		Annual Cost of Labor.	Annual Value of Products
				Male.	Female.		
Iron—castings.....	6	\$ 27,200	\$ 32,990	72	....	\$ 27,000	\$ 57,750
Iron—forging.....	1	10,000	20,000	16	....	7,200	42,750
Jewelry	1	300	1,000	2	....	960	2,800
Leather	8	13,250	10,041	18	....	2,410	18,000
Lime	2	3,150	8,017	7	.. .	1,572	17,200
Looking-glass and picture frames...	2	1,300	4,120	10	....	2,424	8,500
Liquors—distilled	1	200,000	185,800	35	....	12,600	225,000
Liquors—malt	1	10,000	5,000	7	....	2,520	15,000
Lumber—planed.....	3	63,500	80,600	25	....	10,560	103,300
Lumber—sawed	96	328,025	309,256	613	10	132,504	805,752
Machinery, steam engines, &c.....	12	252,600	146,004	513	....	171,744	563,945
Marble and stone work.....	2	3,700	21,000	38	....	7,440	41,300
Medicines.....	1	2,000	9,300	4	1	720	24,000
Millinery.....	2	710	3,500	....	14	1,368	8,600
Musical instruments, pianos, &c.....	1	150,000	174,000	225	....	30,000	213,750
Nails and spikes.....	1	2,000	800	12	....	3,000	4,200
Ornaments—plaster	1	100	250	2	....	720	1,225
Painting	1	100	500	2	....	720	1,500
Paper for printing.....	1	41,000	40,000	24	12	9,000	75,000
Plaster—ground	4	9,500	16,700	4	....	840	31,210
Printing.....	5	41,900	22,453	57	....	13,920	40,044
Plumbing and gas-fitting.....	2	20,000	16,410	29	....	10,200	35,000
Pottery ware.....	2	6,000	2,550	20	....	5,400	15,000
Pumps	1	1,500	240	1	....	720	1,500
Regalia, banners, flags, &c	1	2,000	600	3	....	432	1,500
Saddlery and harness.....	21	31,975	40,919	57	....	33,192	100,710
Sails	1	2,500	8,000	5	....	1,800	12,000
Sash, doors and blinds.....	6	28,600	16,862	49	....	16,596	50,700
Saws	2	8,000	13,200	16	....	4,992	29,000
Ship and boat building.....	5	4,950	6,540	39	....	9,960	23,700
Soap and candles.....	9	93,200	83,027	38	....	11,340	140,012
Springs—steel.....	1	500,000	106,300	25	....	9,600	225,000
Stair-building.....	1	500	300	3	....	1,440	4,000
Staves, shooks and heading.....	3	500	5,600	15	....	5,640	13,575
Iron, copper and sheet-iron ware....	18	87,750	70,439	129	....	40,376	175,200
Tobacco—manufactured.....	52	1,121,025	2,882,415	3,370	34	714,384	4,538,995
Trunks, &c.....	1	500	1,000	3	....	1,296	2,600
Wagons, carts, &c.....	39	23,180	39,547	125	....	33,945	105,007
Willow ware.....	2	300	555	3	....	1,059	1,700
Woolen goods.....	1	130,000	96,000	100	....	27,600	200,000
TOTALS.....	966	\$6,096,490	\$9,480,391	9,908	277	\$2,555,868	\$16,019,801

The agricultural implements were made in King William, Sussex and Henrico. Blacksmithing is only credited to one-third of the counties, giving none to the Northern Neck, save King George; none to the Middlesex, and only to Gloucester, of the Gloucester Peninsula; *none* to King William, New Kent, York, Warwick, Charles City, Prince George, Surry, Isle of Wight, Nansemond, or Northampton; so that numerous shops, &c., were not reported. Boots and shoes were made in 13 counties, but Henrico produced 17-21ths of the whole, and Norfolk 2-21ths. Bread and crackers and bricks were made in Elizabeth City, Henrico and Norfolk. Carpentry was confined to James City and Henrico. Carriages were manufactured in 19 counties, Henrico having 14-34ths, Caroline 3-34ths and Norfolk 6-34ths of the whole product; the notable omissions are Hanover, New Kent, Isle of Wight and Nansemond. Men's clothing is 6-13ths of it credited to Norfolk and the same to Richmond. Cooperage is confined to Southampton, Norfolk and Henrico. Coffins are given to James and Elizabeth City. Isle of Wight and Henrico monopolized cotton goods, and cotton ginning was done in King William. The shad fisheries were in King George, York, Norfolk and Northampton, and the oyster in Gloucester and Norfolk. Flour and meal were ground in all but Westmoreland, Richmond, Essex, Middlesex, Prince George and the Eastern Shore—Henrico having 5-7ths of the whole product, followed by Caroline and Sussex each about 1-42d. Cabinet furniture was made in Henrico, Norfolk, Nansemond and Accomac, 74-103ls of all in Henrico and 25 in Norfolk. Iron castings were produced in Hanover, Henrico and Norfolk, 81-87ths of the product being credited to Henrico. Leather was tanned in Northumberland, Lancaster, Gloucester, Caroline, Henrico, Isle of Wight and Accomac, one establishment in each county named, except Northumberland, which had two. Saw mills were credited to all the counties but King George, Westmoreland, Richmond, Essex, Southampton and Accomac; Warwick was first in production with 12-80ths of the value, followed by York with 10-80ths, Prince George and Henrico each 7-80ths, these four sawing about half the product. Machinery and steam engines were made in Hanover, Henrico and Norfolk, 51-56ths of the production being from Henrico. Elizabeth City, by the census, was the only county that had any painting done. Plaster was ground in Henrico and King George, 30-31ths of it in the former. Printing, by the census, was confined to four establishments in Norfolk and one in James City, and no mention is made of Henrico, including Richmond, with its numerous newspaper, book and job printing establishments. Eleven counties had saddlery and harness shops, but 78-100ths of the annual product was from Henrico and 13-100ths from Norfolk. Sash, doors and blinds were made in Hanover, Henrico and Norfolk; 28-50ths of the production was from Henrico, and 20-50ths from Norfolk. Ship and boat building was carried on in York, Elizabeth City, Henrico and Isle of Wight, the production being nearly the same in each; the omission of Norfolk should be noted. Wagons, carts, &c., were manufactured in 12 counties, but 77-105ths of the production was in Henrico and 9-105ths in Hanover.

The following manufactures were carried on in *Henrico* county (including Richmond city) *alone*, viz: Making tobacco boxes, brass founding, ladies' clothing and hoop skirts, mining bituminous coal, confectionery, copper smithing, cordage, hardware, file and lock making, hats and caps, bar, sheet and railroad iron, iron forging,

jewelry, lime, looking glass and picture frames, distilled and malt liquors, planed lumber, marble and stone cutting, medicines, millinery, nails and spikes, plaster ornaments, printing paper, plumbing and gas fitting, pottery ware, pumps, regalia, banners, &c., sails, saws, steel springs, stairs, tobacco manufacture, trunks, willow ware and woolen goods.

These industries were found only in Henrico and Norfolk counties, viz: Book binding and blank books, making cigars, fire arms, soap and candles, and tin, copper and sheet iron ware.

In Norfolk county (including Norfolk city, Portsmouth, &c.) *alone* were the following, viz: The making of cars, chemicals, gas, musical instruments, and staves, shooks and heading.

The manufactures of Richmond are numerous and important, and the following statistics* of value of products show that they are in a healthy condition, notwithstanding the depression in business during the years presented:

PRODUCTS.	1872.	1873.	1874.
Iron, nail, architectural iron, and railroad car works, and iron ware.....	\$ 5,492,000	\$ 4,081,600	\$ 2,946,760
Tobacco and cigars.....	5,205,600	5,062,466	8,327,581
Flour, meal and mill offal.....	2,045,000	2,422,000	† 2,214,653
Agricultural implements.....	368,000	323,600	435,300
Furniture, mattresses and wooden ware, including barrels, buckets, } brooms, &c.....	378,965	332,400	396,514
Leather, as boots, shoes, trunks, harness, belting, &c.....	298,300	273,500	251,750
Fertilizers, lime, sumac, dye-stuffs, oils, &c.....	375,495	491,000	472,400
Printers' types and material, paper, paper boxes and twine, lithographs, } photographs, books, &c.....	137,110	314,650	1,031,087
Refined sugars.....	803,850	‡	.....
Lager beer, ale, wines and liquors.....	187,250	193,200	116,000
Carriages, wagons, carts, &c.....	95,300	121,300	126,520
Cotton goods, clothing, &c.....	523,000	865,900	682,500
Sash, blinds, doors and mouldings.....	.....	.....	113,375
Miscellaneous manufactures, such as soap, candles, cakes, crackers, } bread, candy, pumps, ship rigging, rope, tin ware, brushes, spirits, } stone, earthen and marble wares, blank books, picture frames, &c....	235,000	344,520	632,250
TOTALS.....	\$16,199,870	\$14,881,136	\$17,746,720

The values for 1870 were \$7,000,000, and for 1871, \$14,840,146.

The gas works of the city of Richmond manufactured as follows, viz:

In 1872—66,260,700 cubic feet of gas from 273,687 bushels of coal.

In 1873—83,686,200 cubic feet of gas from 297,294 bushels of coal.

In 1874—81,812,600 cubic feet of gas from 288,345 bushels of coal.

* From the annual exhibits of the Richmond Dispatch.

† One of the largest flouring mills was burned in April, diminishing the product.

‡ This was the "panic" year, and the sugar refineries stopped early in the year.

The counties* of Middle Virginia, in 1860, were credited with these totals of manufactures :

COUNTIES.	Number of Es- tablishments.	Capital Invested.	Cost of Raw Materials.	Number of Hands Employed.		Annual Cost of Labor.	Annual Value of Products.
				Male.	Female		
Alexandria	96	\$357,250	\$403,659	732	149	\$193,350	\$761,290
Amelia	37	69,575	128,352	71	....	16,374	153,545
Appomattox.....	17	42,900	24,920	57	2	13,356	51,542
Buckingham.....	28	92,480	118,416	82	....	20,776	169,904
Brunswick.....	36	70,200	132,677	65	....	13,932	176,820
Cumberland.....	33	41,600	23,795	55	....	9,564	42,326
Chesterfield.....	50	2,372,624	1,539,895	1,208	497	373,350	2,686,870
Campbell	141	1,242,190	1,918,814	1,900	314	445,044	3,171,360
Charlotte	33	21,030	39,615	58	....	13,404	64,765
Dinwiddie.....	78	1,133,795	2,091,187	2,150	961	626,168	3,570,855
Fairfax.....	..	.....	.....	....	....	.....	.....
Fluvanna.....	58	148,940	185,475	304	35	64,136	300,455
Goochland.....	38	80,150	85,914	75	....	15,756	126,683
Greensville.....	15	50,375	76,020	30	1	5,772	92,827
Halifax.....	55	155,145	84,128	207	10	42,390	159,213
Louisa.....	57	218,800	277,320	279	3	58,392	455,950
Lunenburg.....	14	40,450	49,201	20	....	3,912	59,147
Mecklenburg	65	140,525	352,420	489	140	85,122	518,398
Nottoway.....	45	124,225	127,863	119	3	33,472	186,541
Prince William.....	47	166,480	160,836	108	5	26,268	235,927
Powhatan.....	20	66,800	15,150	34	....	6,180	23,950
Pittsylvania.....	141	439,525	1,176,172	1,136	238	370,626	1,670,257
Prince Edward.....	24	91,325	193,459	261	52	53,820	299,917
Stafford.....	33	131,900	218,946	339	34	29,630	302,920
Spotsylvania.....	72	144,650	147,592	391	36	109,808	368,050
TOTALS.....	1,233	\$7,442,934	\$9,571,826	10,170	2,480	\$2,630,602	\$15,685,012

The manufacturing centres of Midland Virginia were: 1st, Dinwiddie, including most of Petersburg, at the falls of the Appomattox; 2d, Campbell, including Lynchburg, on the James; 3d, Chesterfield, including Manchester, at the falls of the James opposite Richmond; 4th, Pittsylvania, including Danville, on the Dan; 5th, Alexandria, on the Potomac; and 6th, Spotsylvania and Stafford, including Fredericksburg and Falmouth, on the Rappahannock at the falls.

*It is well to call attention to a statement in Chapter I. that all the counties are *not wholly included* in the Natural Divisions in which they are grouped, but they are placed where the larger portion of their area lies. The figures are taken from *county* returns, therefore they must follow the county in grouping. A census-taking by smaller political divisions would remedy these defects, but the general result would not vary much from that given, because of the compensation of areas.

The results of manufacturing in MIDDLE VIRGINIA, by the census of 1860, were:

KIND.	Number of Establishments.	Capital Invested.	Cost of Raw Material.	Number of Hands Employed.		Annual Cost of Labor.	Annual Value of Products.
				Male.	Female.		
Agricultural implements.....	15	\$ 54,300	\$ 34,272	107	1	\$ 31,800	\$ 110,349
Bark, ground, sumac.....	2	9,200	9,200	8	....	1,920	14,000
Blacksmithing.....	140	45,870	29,588	279	....	64,284	124,619
Book-binding and blank books.....	4	4,300	4,738	10	....	3,444	11,000
Bread, crackers, &c.....	6	20,750	43,070	34	....	7,740	67,500
Brick.....	19	55,950	16,345	201	....	26,964	76,680
Brooms.....	1	500	700	3	....	1,080	4,000
Boots and shoes.....	54	84,680	83,047	298	63	89,916	226,394
Boxes—tobacco.....	7	15,895	19,388	44	....	16,728	46,648
Coal—bituminous.....	4	1,050,000	45,500	413	3	122,088	285,090
Cars.....	4	38,000	11,180	105	....	35,440	62,100
Chemicals.....	1	100	500	2	....	720	2,000
Coffins.....	1	500	300	1	....	540	1,700
Cigars.....	4	2,800	5,350	7	....	2,580	10,500
Clothing—men's.....	18	27,750	61,624	68	80	39,324	126,913
Carriages.....	31	64,125	50,687	253	1	91,416	190,770
Confectionery.....	40	36,700	51,950	29	....	8,472	87,700
Carpentering.....	9	23,000	32,257	73	....	29,664	90,160
Cotton goods.....	11	1,212,000	678,990	596	742	223,728	1,256,600
Cooperage.....	15	20,370	14,320	88	....	13,620	37,885
Cordage.....	1	4,000	10,000	6	1	6,636	16,000
Dyeing and bleaching.....	1	100	300	1	....	432	1,200
Flour and meal.....	279	1,444,675	3,624,239	518	2	124,240	4,300,588
Furniture—cabinet.....	27	67,800	31,621	121	1	42,888	105,771
Fire-arms.....	1	2,700	800	2	....	720	2,000
Fertilizers.....	2	37,000	202,500	32	....	10,800	223,000
Fisheries—shad.....	17	26,000	15,400	401	4	19,070	50,250
Glue.....	1	1,000	1,000	2	....	480	1,550
Gas.....	1	70,000	5,000	5	....	1,920	17,000
Gold-mining.....	2	37,000	9,000	33	....	4,200	35,000
Hats and caps.....	4	3,800	2,765	8	1	2,580	7,275
Iron castings.....	17	183,100	88,413	221	....	75,852	271,300
Jewelry.....	1	3,000	50	2	....	1,080	1,200
Leather.....	38	95,900	113,299	116	....	27,306	173,852
Liquors—malt.....	1	5,000	6,120	4	....	1,200	2,000
Liquors—distilled.....	1	25,000	750	3	....	432	1,800
Lumber—sawed.....	161	304,429	183,117	495	4	99,664	444,686
Lumber—planed.....	1	3,000	5,700	5	....	1,200	7,360
Locomotives.....	1	20,000	120,700	80	....	9,360	133,000

TABLE OF MANUFACTURES CONTINUED.

KIND.	Number of Establishments.	Capital Invested.	Cost of Raw Material.	Number of Hands Employed.		Annual Cost of Labor.	Annual Value Produced.
				Male.	Female.		
Mineral waters.....	1	\$ 300	\$ 150	2	....	\$ 480	1
Machinery, steam engines, &c.....	4	54,000	76,500	144	....	39,900	14
Marble and stone works.....	5	15,700	22,000	72	....	25,748	8
Millinery	4	17,775	18,775	16	....	3,720	3
Pipes—clay.....	1	500	150	3	....	684	1
Pottery ware.....	2	3,000	1,700	8	....	3,552	3
Plaster—ground	6	26,400	20,885	16	....	4,956	3
Sash, doors and blinds.....	2	18,200	17,275	25	....	8,400	3
Ship and boat building.....	2	2,000	10,000	15	....	1,584	1
Spokes, hubs and felloes.....	1	3,000	2,000	5	....	1,080	1
Saddlery and harness.....	35	49,625	51,529	112	....	35,048	11
Slate quarrying.....	2	26,000	210	21	....	7,860	1
Soap and candles.....	5	33,000	27,600	23	4	5,670	5
Tin, copper and sheet iron.....	20	37,250	51,148	84	....	26,652	10
Tobacco—manufactured.....	134	1,993,265	3,617,894	7,851	1,452	1,186,164	6,28
Wool carding.....	4	5,000	10,600	7	....	1,008	1
Woolen goods.....	1	22,500	5,990	12	5	2,796	2
Wagons, carts, &c.....	61	35,625	18,150	141	....	35,772	7
TOTALS.....	1,233	\$7,442,934	\$9,571,826	10,170	2,480	\$2,630,602	\$15,68

Most of the agricultural implements were made in Halifax, Spotsylvania, Campbell and Alexandria. The sumac mills were in Spotsylvania and Alexandria. Blacksmithing is credited to all but Greenville, Brunswick, Prince Edward, Powhatan, Buckingham, Spotsylvania and Fairfax. Book-binding was done in Alexandria, Spotsylvania, Dinwiddie and Campbell. Bread and cracker making limited to Alexandria and Campbell; brick making to Alexandria, Spotsylvania, Goochland, Chesterfield and Campbell. Brooms, chemicals, cigars, dyeing, bleaching, malt liquors, mineral waters and clay pipes were only made in Alexandria. Boots and shoes were made in all the counties but Fairfax, Stafford, Culpeper, Berkeley, Powhatan, Lunenburg, Greenville and Mecklenburg; tobacco boxes in Goochland, Campbell, Pittsylvania and Mecklenburg. The coal was mined in Chesterfield. Railroad cars were made in Alexandria and Campbell; coffins in Pittsylvania; men's clothing mostly in Alexandria, Spotsylvania, Pittsylvania and Campbell; carriages in 11 counties, more in Campbell and Dinwiddie than elsewhere; confectionery in Alexandria, Lynchburg, Fredericksburg and Petersburg. Candy making was confined to Spotsylvania, Campbell and Pittsylvania. Cotton goods were produced in Alexandria, Chesterfield, Stafford, Dinwiddie, Fluvanna and Mecklenburg. Cooperage was a considerable industry in Chesterfield, Campbell, Spotsylvania, &c. Cordage was made only in Dinwiddie; gas and fire arms in Campbell.

ue in Alexandria; distilled liquors in Goochland; pottery in Alexandria and Dinwiddie; ship and boat building in Fluvanna; locomotive making in Chesterfield; woolen goods in Prince William; jewelry and watch making in Halifax; lumber planing in Pittsylvania; shad fisheries in Alexandria and Stafford; hat and cap making in Alexandria and Pittsylvania; sash, blind and door making in Alexandria and Campbell; spokes, hubs and felloes in Prince William; fertilizers in Alexandria and Dinwiddie; slate quarrying in Buckingham; gold mining in Stafford and Spotsylvania; millinery in Spotsylvania and Campbell. Cabinet furniture was made in 10 counties, but largely in Alexandria and Campbell. Leather was made in 16 counties, but most extensively in Alexandria, Dinwiddie and Campbell. Wool carding was done in Campbell, Prince William, Louisa and Fluvanna; marble and stone cutting in Alexandria, Fluvanna, Chesterfield, Dinwiddie and Campbell; plaster grinding in Alexandria, Prince William, Fluvanna and Campbell. Tin, copper and sheet iron ware were made in Alexandria, Spotsylvania, Prince Edward, Dinwiddie, Greenville and Pittsylvania. Flour and meal were made in all the counties but Fairfax, Alexandria and Spotsylvania, says the census, but it is well known that all of these manufactured these articles on a large scale. Tobacco was manufactured in Spotsylvania, Louisa, Fluvanna, Chesterfield, Prince Edward, Dinwiddie, Campbell, Pittsylvania, Halifax and Mecklenburg—Dinwiddie leading, followed by Campbell and Pittsylvania. Saddlery and harness were made in all the counties save Fairfax, Stafford, Goochland, Powhatan, Chesterfield, Appomattox, Greenville and Halifax—all of which no doubt had many establishments; the leading county was Dinwiddie. Wagons and carts were manufactured in all but Fairfax, Stafford, Powhatan, Prince Edward, Lunenburg and Brunswick—Pittsylvania leading. Soap and candles were the products of Alexandria, Goochland and Dinwiddie; machinery of Spotsylvania, Fluvanna, Dinwiddie and Pittsylvania. Iron castings were made in twelve counties—Campbell leading far in advance. Sawed lumber was produced in every county but Fairfax and Alexandria—Pittsylvania leading.

It will be seen from the table on preceding page that the leading manufacture of the Middle Country was tobacco, producing 6-16ths of the whole; the second was flour and meal, yielding 4-16ths; and the third cotton goods—these three producing three-fourths of the value of the annual product.

Fredericksburg is a very important manufacturing town of Midland Virginia. Its woolen factory has acquired a wide reputation for the broad-cloths, cassimeres, jerseys and blankets it manufactures. Its two cotton mills make cotton cloths, snaburgs, yarn, &c. The two foundries manufacture stoves, agricultural implements, hollow-ware, water and steam machinery, &c. The three merchant flouring mills have a capacity for grinding 500,000 bushels of grain annually. Two sumac mills are in operation, one of them the first opened in Virginia. A paper mill, two tanneries, two carriage and wagon manufactories, and a planing mill and sash, &c., factory, three furniture, three saddle and harness, seven blacksmith, two gun and blacksmith, two jewelers, and a large number of boot and shoe shops, seven bakeries, one brewery, two distilleries, one soap factory, and three newspaper printing offices, are among the reported* industries. It was estimated that in 1867 Fredericksburg

*See report of Fredericksburg Manufacturers and Mechanics Association, 1869.

sold, of its manufactures, for home consumption the value of \$150,000, and to other markets \$500,000.

The MANUFACTURING STATISTICS of PIEDMONT, by counties, for 1860, were as follows:

COUNTIES.	Number of Establishments.	Capital Invested.	Cost of Raw Material.	Number of Hands Employed.		Annual Cost of Labor.	Annual Value of Products.
				Male.	Female.		
Albemarle	73	\$257,140	\$483,085	215	27	\$46,908	\$605,010
Amherst	45	51,910	76,474	84	2	20,264	112,245
Bedford	84	273,030	405,282	439	34	88,374	598,919
Culpeper	7	51,335	95,212	71	27	18,612	159,175
Fauquier	110	251,316	185,842	248	20	63,612	337,848
Franklin	85	346,470	345,984	476	81	73,964	485,233
Greene	22	14,800	31,841	34	..	7,200	47,315
Henry	52	293,115	239,326	496	93	91,758	408,245
Loudoun	83	274,786	570,601	288	8	70,889	750,178
Madison	15	52,800	43,627	36	..	9,120	57,080
Nelson	23	38,540	105,877	40	..	9,294	132,165
Orange	45	69,855	108,677	90	..	19,368	143,360
Patrick	10	74,700	44,070	95	29	14,607	70,790
Rappahannock	34	41,655	75,861	62	..	11,568	102,859
TOTALS	638	\$2,091,452	\$2,761,759	2,674	321	\$545,538	\$4,010,422

These figures give this section *about* 1-7th of the number of establishments, 1-9th of the invested capital, 1-7th of the cost of raw materials, 1-10th of the males and females employed, 1-11th of the annual cost of labor, and 1-10th of the annual value of products, compared with those for the whole State.

The following table presents the DETAILS of the several MANUFACTURING INDUSTRIES then carried on in PIEDMONT:

MANUFACTURING INDUSTRIES.	Number of Establishments.	Capital Invested.	Cost of Raw Material.	Number of Hands Employed.		Annual Cost of Labor.	Annual Value of Products.
				Male.	Female.		
Agricultural implements	7	\$20,150	\$10,585	39	..	\$8,640	\$28,200
Boots and Shoes	43	28,771	25,567	115	15	29,772	74,749
Blacksmithing	68	28,190	16,703	139	..	30,924	61,995
Brick	2	2,000	215	15	..	1,380	3,290
Cigars	1	5,000	3,500	10	..	2,400	7,500
Cotton goods	2	30,300	36,770	15	15	3,912	51,560
Cooperage	3	2,000	1,745	11	..	2,676	5,920
Carriages	8	22,200	7,658	38	1	13,008	37,400
Carpentry	2	4,950	2,850	15	..	4,080	15,500
Copper ore	1	15,000	1,800	9	2	4,968	9,000

TABLE OF MANUFACTURES CONTINUED.

MANUFACTURING INDUSTRIES.	Number of Establishments.	Capital Invested.	Cost of Raw Material.	Number of Hands Employed.		Annual Cost of Labor.	Annual Value of Products.
				Male.	Female.		
Clothing—men's.....	4	\$ 2,910	\$ 8,120	6	5	\$ 2,400	\$ 12,146
Dentistry.....	3	2,200	1,400	3	..	1,650	4,900
Flour and meal.....	212	675,765	1,604,668	278	..	62,050	1,866,373
Furniture—cabinet.....	10	8,965	7,796	28	..	6,482	16,311
Gold mining.....	1	10,000	.....	8	1	1,032	1,200
Hats and caps.....	3	3,900	1,989	7	2	2,274	7,950
Iron—pig.....	3	124,000	35,687	121	5	29,670	77,000
Iron—castings.....	3	2,500	1,610	0	..	1,212	4,100
Iron—bar, &c.....	1	10,000	7,200	15	..	1,620	9,000
Leather.....	44	96,525	89,318	106	1	22,440	146,242
Lumber—sawed.....	106	130,845	51,448	251	5	48,780	222,844
Liquor—distilled.....	1	700	1,730	1	..	180	3,200
Mattresses, beds, &c.....	1	800	1,720	2	..	720	2,700
Plaster—ground.....	24	27,000	31,770	23	..	4,194	43,670
Pottery.....	2	600	300	6	..	984	1,900
Printing.....	3	4,100	550	9	..	3,360	5,060
Saddlery and Harness.....	16	8,405	9,624	27	..	7,032	22,520
Sash, doors and blinds.....	1	300	625	4	..	900	2,000
Tin, copper and sheet iron.....	10	16,416	8,780	21	..	4,122	15,939
Tobacco—manufactured.....	64	639,100	613,479	1,207	224	205,368	1,002,572
Woolen goods.....	9	93,550	125,432	74	44	22,764	203,205
Watch repairing and Silversmithing,	1	1,600	1,550	2	..	1,720	2,875
Wool carding.....	10	6,750	13,220	11	1	1,242	17,820
Wagons, carts, &c.....	20	15,960	6,365	37	..	12,552	22,781
TOTALS.....	688	\$2,091,452	\$2,761,759	2,674	321	\$545,538	\$4,010,422

These enumerated industries were distributed among the Piedmont counties as follows, viz: Cigars, pottery, and sash, doors and blinds, only in Loudoun; gold and copper mining, watch repairing, dentistry, brick making and liquor distilling, only in Fauquier; bar iron only in Franklin; cotton goods and mattresses only in Albemarle; printing in Nelson and Bedford; iron casting in Fauquier, Bedford and Henry; pig iron in Loudoun, Franklin and Patrick; carpentry in Fauquier and Amherst; hats and caps in Loudoun, Fauquier and Bedford; flour and meal in all the counties but Culpeper and Patrick; leather in all but Culpeper, Nelson and Patrick; sawed lumber in all but Madison and Patrick; furniture in Loudoun, Fauquier, Amherst, Bedford and Franklin; cooperage in Loudoun and Albemarle; boots and shoes in all but Culpeper, Franklin and Patrick; carriages in Loudoun, Fauquier, Madison and Bedford; blacksmithing in all but Culpeper, Albemarle, Nelson, Henry and Patrick; agricultural implements in Loudoun, Madison, Greene, Orange, Albemarle, Bedford and Franklin; wool carding in Fauquier, Greene, Amherst, Bedford and Franklin; woolen goods in Loudoun, Fauquier, Culpeper and

Albemarle; men's clothing in Fauquier, Greene and Franklin; tobacco manufactured in Albemarle, Bedford, Franklin, Henry and Patrick; plaster ground in Loudoun, Fauquier, Rappahannock, Albemarle, Nelson and Bedford; saddlery and harness in all but Culpeper, Madison, Albemarle, Nelson, Amherst and Henry; and tin, copper and sheet iron ware in Loudoun, Fauquier, Madison, Greene, Bedford and Patrick.

The BLUE RIDGE counties in 1860 furnished the following MANUFACTURING RETURNS:

COUNTIES.	Number of Establishments.	Capital Invested.	Cost of Raw Materials.	Number of Hands Employed.		Annual Cost of Labor.	Annual Value of Products.
				Male.	Female.		
Carroll.....	42	\$ 121,400	\$ 53,377	136	....	\$ 29,332	\$ 105,007
Floyd.....	10	13,515	14,894	18	....	4,326	23,210
Grayson.....	10	22,600	56,470	16	....	3,936	70,240
TOTALS.....	62	\$157,515	\$124,741	170	....	\$37,644	\$198,457

Comparing these totals with those of the State, this section shows about 1-70th of the establishments, 1-163d of the invested capital, 1-160th of the cost of raw material, 1-154th of the males employed, 1-178th of the cost of labor, and 1-210th of the annual value of products.

The following were the DETAILS of MANUFACTURING in the BLUE RIDGE SECTION in 1860:

INDUSTRIES.	Number of Establishments.	Capital Invested.	Cost of Raw Materials.	Number of Hands Employed.		Annual Cost of Labor.	Annual Value of Products.
				Male.	Female.		
Boots and shoes.....	1	\$ 215	\$ 305	1	....	\$ 360	\$ 1,100
Fire-arms.....	1	1,500	472	3	....	360	1,100
Flour and meal.....	30	40,150	93,656	36	....	7,334	117,528
Cabinet furniture.....	2	1,600	482	4	....	1,620	2,280
Leather.....	8	6,350	8,835	15	....	2,940	14,860
Distilled liquors.....	1	500	405	1	....	336	700
Saddlery and harness.....	2	1,300	1,040	4	....	1,050	2,730
Wool carding.....	3	4,400	5,170	3	....	340	6,334
Copper ore.....	4	70,000	5,700	78	....	17,520	31,633
Copper smelting.....	1	25,000	2,100	12	....	2,880	5,880
Iron castings.....	1	500	500	2	....	600	2,000
Lumber—sawed.....	5	2,800	4,036	6	....	1,200	8,122
Linseed oil.....	1	500	360	1	....	120	810
Tin, copper and sheet iron ware.....	2	2,700	1,630	4	....	984	3,300
TOTALS.....	62	\$157,515	\$124,741	170	....	\$37,644	\$198,457

These enumerated industries were distributed among the counties as follows: Boots and shoes, fire-arms and distilled liquors were only made in Floyd; copper

mining and smelting, iron casting and linseed oil making were confined to Carroll; flour and meal and leather were made in all the counties; cabinet furniture, saddlery and harness and wool carding were industries of Floyd and Carroll; lumber sawing and tin, &c., ware making, were conducted in Carroll and Grayson.

Carroll, as a consequence of its greater amount of water-power, leads in manufacturing.

THE VALLEY counties in 1860 had the following returns of their MANUFACTURING RESULTS:

COUNTIES.	Number of Establishments.	Capital Invested.	Cost of Raw Materials.	Number of Hands Employed.		Annual Cost of Labor.	Annual Value of Products.
				Male.	Female.		
Angusta.....	197	\$ 639,010	\$ 615,546	471	31	\$ 129,114	\$ 915,713
Botetourt.....	65	198,200	226,591	241	6	55,458	357,955
Clarke.....	16	63,700	121,102	42	....	14,340	176,075
Frederick.....	127	276,250	499,961	373	53	98,576	729,051
Montgomery.....	45	61,880	76,700	136	3	39,920	155,235
Page.....	60	137,175	163,197	103	....	19,560	206,136
Pulaski.....	30	51,200	32,880	84	....	22,212	72,295
Rockbridge.....	220	550,716	552,116	637	1	159,203	958,743
Roanoke.....	22	157,300	205,406	124	....	18,283	274,012
Rockingham.....	122	384,550	274,556	321	11	74,908	423,538
Shenandoah.....	48	257,805	86,755	200	5	40,372	169,333
Smyth.....	9	61,000	36,640	97	....	23,892	89,200
Warren.....	36	100,360	169,459	83	....	19,821	251,259
Washington.....	199	173,215	193,756	338	4	92,736	360,066
Wythe.....	24	447,800	61,760	330	6	59,814	165,550
TOTALS.....	1,220	\$3,560,191	\$3,316,550	3,590	120	\$368,214	\$5,303,216

A comparison of these Valley aggregates with those for the State, shows that the Valley had *about* 1-3 $\frac{1}{2}$ th of the establishments, 1-5th of the capital invested, paid 1-6th of the cost of material, employed 1-7th of the male and 2-26th of the female hands, paid 1-8th of the cost of labor, and received 1-8th of the value of products.

The following table gives the DETAILS, by INDUSTRIES, in THE VALLEY:

INDUSTRIES.	Number of Establishments.	Capital Invested.	Cost of Raw Material.	Number of Hands Employed.		Annual Cost of Labor.	Annual Value of Products.
				Male.	Female.		
Agricultural implements.....	9	\$ 13,900	\$ 16,097	62	....	\$ 17,844	\$ 45,875
Boots and shoes.....	65	53,971	55,757	133	19	50,712	139,609
Blacksmithing.....	130	47,835	37,451	263	....	60,768	130,543
Buckskin dressing.....	1	150	2,200	3	....	450	3,190
Bituminous coal.....	1	20,000	775	12	....	4,152	11,200
Carpentering.....	19	20,050	24,794	108	....	29,868	83,685
Carriages.....	23	65,225	34,448	166	1	55,776	129,775
Cigars.....	7	9,300	15,250	41	....	11,460	37,380
Clothing—men's.....	15	11,440	20,925	30	15	9,728	37,441
Clothing—ladies'.....	1	150	2,000	....	4	1,200	6,000

TABLE OF INDUSTRIES CONTINUED.

INDUSTRIES.	Number of Es- tablishments.	Capital Invested.	Cost of Raw Material.	Number of Hands Employed.		Annual Cost of Labor.	Annual Value of Products.
				Male.	Female.		
Cooperage.....	18	\$ 5,290	\$ 5,536	39	....	\$ 6,396	\$ 15,595
Confectionery.....	1	6,800	4,420	9	....	2,088	8,220
Cement.....	1	75,000	42,100	150	....	42,000	180,000
Coffins.....	2	650	610	3	....	1,260	2,300
Crackers, bread, &c.....	1	400	1,200	2	....	360	1,900
Dentistry.....	2	950	950	2	....	960	2,900
Fertilizers.....	1	400	750	2	....	300	1,200
Flour and meal.....	309	1,190,030	2,132,017	407	....	88,294	2,446,870
Furniture—cabinet.....	33	33,900	15,478	93	....	24,768	57,355
Fire-arms.....	2	250	350	2	....	480	1,100
Gas.....	1	17,600	2,400	4	....	1,440	5,000
Gloves and mittens.....	4	3,000	6,485	12	22	4,692	12,420
Hats and caps.....	4	12,400	3,400	6	2	1,902	8,200
Iron castings.....	11	48,200	21,910	55	....	15,344	64,450
Iron—bar, sheet and railroad.....	12	156,725	50,815	127	....	26,868	97,710
Iron—blooms.....	1	27,000	25,825	14	....	5,040	32,000
Iron—pig.....	11	457,405	91,157	385	....	78,792	220,273
Lead ore.....	1	5,000	1,460	40	....	3,600	9,000
Lead and shot.....	1	300,000	18,670	125	....	21,600	52,000
Leather.....	73	220,050	151,542	188	....	44,202	258,061
Lumber—sawed.....	198	198,677	119,557	289	....	60,936	254,364
Liquors—malt.....	1	2,000	1,010	1	....	180	1,676
Liquors—distilled.....	54	130,813	113,948	86	....	20,820	238,313
Lime.....	1	1,300	1,100	6	....	1,872	7,500
Manganese.....	1	2,000	500	10	....	3,600	5,250
Marble and stone work.....	4	5,075	3,800	12	....	1,686	7,400
Millinery.....	3	700	7,500	....	9	1,080	12,050
Machinery, steam engines, &c.....	1	8,000	5,850	10	....	2,400	14,000
Millwrighting.....	3	300	300	5	....	1,500	2,800
Oil—linseed.....	1	500	508	1	....	156	1,000
Paper—printing.....	1	22,500	10,000	7	4	3,000	18,000
Painting.....	2	965	5,065	12	....	3,660	11,000
Pottery.....	5	2,400	640	11	....	3,468	7,300
Photographs.....	3	3,300	1,285	3	....	1,440	4,100
Printing.....	11	46,200	8,999	46	7	9,996	38,305
Plaster—ground.....	15	14,500	19,480	16	..	1,710	23,852
Plaster—quarried.....	2	17,000	4,000	30	....	6,600	16,600
Salt.....	2	43,000	23,600	55	....	17,400	72,000
Saddlery and harness.....	34	31,900	23,901	77	....	21,285	60,648
Silver-plating.....	1	150	79	1	....	240	550

TABLE OF INDUSTRIES CONCLUDED.

INDUSTRIES.	Number of Es- tablishments.	Capital Invested.	Cost of Raw Material.	Number of Hands Employed.		Annual Cost of Labor.	Annual Value of Products.
				Male.	Female.		
Soap and candles.....	1	\$ 1,200	\$ 4,500	2	....	\$ 360	\$ 5,100
Spokes, hubs and felloes.....	1	1,800	606	4	....	480	1,290
Staves, shooks and heading.....	1	1,100	5,630	8	....	2,520	12,650
Tin, copper and sheet iron ware.....	25	28,750	38,648	63	....	16,504	64,955
Tobacco—manufactured.....	5	25,100	24,831	87	....	9,416	53,050
Wagons, carts, &c.....	42	23,015	14,757	108	....	25,143	57,492
Wool carding.....	15	3,300	17,720	15	....	1,374	24,145
Woolen goods.....	13	124,550	75,747	90	37	25,884	138,160
Watch repairing and silver smithing,	4	3,025	1,098	5	....	2,460	4,400
TOTALS.....	1,220	\$3,560,191	\$8,316,550	3,590	120	\$568,214	\$5,303,216

Agricultural implements were made in Frederick, Augusta, Rockbridge, Pulaski and Washington; boots and shoes in all the counties but Smyth; blacksmithing is credited to all but Frederick, Warren, Page, Roanoke and Smyth, in all of which there were fully as many shops as in the others in proportion to population; Frederick alone had buck-skin dressing, fertilizer, soap and candle and malt liquor making, silver plating; Washington alone made ladies' clothing, and had mill-wrighting; Page alone made iron blooms; Wythe monopolized mining lead ore and making lead and shot and linseed oil; Rockbridge alone made spokes, hubs and felloes, staves, shooks and heading, and cement; Montgomery, only, mined bituminous coal; Warren made the lime; Augusta had the dentistry, bread and cracker making, the gas works, manganese mining and millinery; Smyth the plaster quarrying, and Wythe the making of machinery and steam engines; carpentry was carried on in Frederick, Rockingham, Rockbridge, Montgomery and Washington; carriages were made in all the counties except Page, Roanoke and Smyth; cigars were manufactured in Frederick, Augusta and Rockbridge; gloves and mittens in Frederick and Shenandoah; hats and caps in Frederick, Augusta, Rockbridge and Wythe; coffins in Rockbridge and Washington; fire-arms in Shenandoah and Washington; wagons and carts in all but Roanoke and Smyth; saddlery and harness in all but Clarke, Montgomery and Washington; tin, copper and sheet iron ware in all but Clarke, Warren, Roanoke, Pulaski and Smyth; distilled liquors in all save Frederick, Clarke, Shenandoah, Roanoke, Wythe and Smyth; woolen goods in Frederick, Rockingham, Augusta, Rockbridge, Botetourt and Roanoke; men's clothing in Frederick, Rockingham, Augusta, Rockbridge, Montgomery and Washington; flour and meal in all but Shenandoah and Wythe (which no doubt were among the largest grinders of the group); cabinet furniture in all except Clarke, Warren, Roanoke and Smyth; cooperage in Frederick, Warren, Shenandoah, Rockingham, Augusta, Rockbridge and Montgomery; iron castings in Frederick, Warren, Shenandoah, Rockingham, Augusta, Rockbridge, Botetourt, Roanoke and Pu-

laski; bar iron in Warren, Page, Shenandoah, Augusta, Rockbridge, Pulaski, Wythe and Smyth; pig iron in Page, Shenandoah, Rockingham, Augusta, Rockbridge, Botetourt and Wythe; salt in Smyth and Washington; leather in all but Clarke and Warren; lumber sawed in all but Clarke and Wythe; plaster ground in Frederick, Page, Augusta and Rockbridge; tobacco manufactured in Frederick, Roanoke and Washington; pottery in Shenandoah, Augusta and Washington; confectionery in Augusta and Rockbridge; watch repairing, &c., in Frederick, Montgomery and Washington; wool carding was done in Augusta, Rockbridge, Pulaski and Washington; printing in Frederick, Warren, Shenandoah, Rockingham, Botetourt, Montgomery and Wythe; painting in Rockbridge and Montgomery; marble and stone work in Augusta, Rockbridge and Montgomery; photographs in Augusta, Rockbridge and Montgomery, and printing paper was made only in Augusta.

The APPALACHIAN counties gave these MANUFACTURING RETURNS in 1860:

COUNTIES.	Number of Establishments.	Capital Invested.	Cost of Raw Material.	Number of Hands Employed.		Annual Cost of Labor.	Annual Value of Products.
				Male.	Female.		
Alleghany.....	27	\$ 49,635	\$ 93,556	74	....	\$ 24,684	\$ 132,851
Bath.....	22	41,200	43,385	37	....	6,924	59,280
Bland.....	....	.....	.....	....	....	.....	.....
Buchanan.....	....	.....	.....	..	....	.....	..
Craig.....	5	11,400	10,930	9	....	2,988	15,838
Giles.....	10	44,660	48,890	12	....	2,656	61,736
Highland.....	12	16,200	15,935	16	....	3,330	24,060
Lee.....	1	7,000	140	3	....	270	600
Russell.....	27	41,781	63,500	36	....	9,348	105,096
Scott.....	2	2,300	2,656	5	....	864	4,885
Tazewell.....	15	15,587	8,511	21	....	4,296	16,020
Wise.....	1	300	300	2	....	360	725
TOTALS.....	122	\$230,063	\$292,803	215	....	\$55,720	\$421,091

Appalachia, compared with the whole State in manufacturing, had *about* 1-13th of the establishments, 1-98th of the invested capital, paid 1-34th of the cost of raw material, employed 1-133rd of the labor, paid 1-110th of the cost of labor, and received 1-104th of the value of products.

In 1860 but little of Appalachia was reached by internal improvements, and nearly all the manufacturing done was for home consumption. No portion of the State has larger resources for manufacturing.

The DETAILS of MANUFACTURING in APPALACHIA for 1860 were:

INDUSTRIES.	Number of Es- tablishments.	Capital Invested.	Cost of Raw Material.	Number of Hands Employed.		Annual Cost of Labor.	Annual Value of Products.
				Male.	Female.		
Agricultural implements.....	1	\$ 800	\$ 141	1	....	\$ 240	\$ 900
Blacksmithing.....	8	7,135	2,505	15	....	3,252	8,100
Boots and shoes.....	7	2,200	3,335	12	....	3,960	9,132
Brick.....	1	600	250	2	....	240	1,200
Cement.....	1	10,000	16,620	30	....	10,800	30,000
Flour and meal.....	38	121,400	209,333	41	....	10,440	249,347
Furniture—cabinet.....	5	1,005	740	5	....	1,350	4,025
Iron—bar.....	3	16,000	4,817	12	....	2,670	9,300
Iron—castings.....	1	3,500	685	3	....	1,260	2,690
Leather.....	23	42,337	26,547	39	....	8,200	57,206
Lumber—sawed.....	12	10,500	7,945	18	....	5,040	16,414
Liquor—distilled.....	5	6,292	6,494	8	....	1,920	6,679
Saddlery and harness.....	11	5,419	5,787	22	....	4,938	15,651
Wagons, carts, &c.....	3	975	400	4	....	1,080	1,948
Wool carding.....	3	1,900	7,200	3	....	300	8,600
TOTALS.....	122	\$230,063	\$292,803	215	....	\$55,720	\$421,071

The agricultural implements were made in Highland, the brick in Bath, the iron castings in Craig, and the cement in Alleghany; boots and shoes were made in Alleghany, Russell and Wise; cabinet furniture in Alleghany, Tazewell and Russell; bar iron in Alleghany and Lee; distilled liquors in Craig and Scott; sawed lumber in Bath, Alleghany and Russell; wagons and carts in Highland, Bath and Russell; leather in all the counties but Giles, Lee, Buchanan and Wise; flour and meal in Highland, Bath, Alleghany, Craig and Russell; saddles and harness in Highland, Bath, Alleghany, Tazewell and Russell; wool carding was carried on in Bath and Russell, and blacksmithing in Highland, Bath, Giles and Russell.

SECTION II.—FACILITIES FOR MANUFACTURING IN VIRGINIA.

The facilities Virginia presents for the successful prosecution of many kinds of manufactures may be summed up as—

1st. A great variety and abundance of RAW MATERIALS, so distributed that they can be obtained at a moderate cost at numerous points.

2d. Ample supplies of WATER POWER, the cheapest of motors, in almost every portion of the State; large areas favorably disposed for using the force of WIND as a moving power; and CHEAP FUEL, as WOOD from the ever-growing forests, or COAL, the concentrated fuel, the most efficient aid in the production of power and in many of the processes of manufacture.

3d. A CLIMATE healthy and every way favorable for industrial pursuits, being generally free from the extremes that hinder the successful and profitable employment of labor the whole year.

4th. CONVENIENCE of access TO MARKETS, both domestic and foreign, by ocean highways, navigable rivers, canals, railways, &c., that furnish numerous channels of communication and cheap conveyance.

5th. A good-SUPPLY of human and animal LABOR, at hand or easily attainable, that can be had for fair and moderate wages.

6th. A large SURPLUS of the best of FOOD for man or beast, furnishing a cheap market.

7th. HOMES, the fee-simple of which can be BOUGHT by the savings of common industry, or which can be cheaply RENTED.

8th. A desire on the part of the State and people to have all kinds of manufacturing, for which facilities are here found, introduced and encouraged.

These are the essentials for securing the location of the world's workshops. That Virginia possesses these advantages, as much as almost any known country, is generally conceded, and the results from the few large manufacturing enterprises that have been carried on in the State demonstrate that these facilities have not been over estimated.

It is easy to explain why comparatively little use has been made of the manufacturing resources of Virginia. An extensive domain, a prolific soil and genial climate, have invited her population to the more pleasant pursuit of agriculture, and satisfied with the abundance that flowed from a not laborious cultivation of the gifts of Providence of one kind, they have been content to hold in reserve, almost untouched, the larger and in some respects more valuable legacy embodied in the raw materials for manufactures and the forces for their exploitation entailed upon them by the same unstinted bounty. The chaos that has come of war incites, by its wide-spread disasters, to a cosmos calling for a larger and more general development; and Virginia, epitomizing in herself, like England, the varied resources that have given strength and wealth to nations, now resolutely determines to cultivate all the arts born of industry and vindicate a claim to pre-eminence in these, as she has in other pursuits, by the fruits furnished in due time.

The chapters in this volume on the Mineral, Animal and Vegetable Resources of the State, and the accompanying physical maps, show: that *iron, copper, lead, gold, salt, coal, limestone, manganese, clays*, and other minerals are abundant and widely distributed; that many varieties of *timber* abound in all sections, while other products of the vegetable kingdom, materials to work up, are exceedingly plentiful; and that large supplies of animal products, to be converted into more valuable forms by labor, are presently available, and that the quantity can be increased so as to equal almost any demand.

The facts given warrant the statement that the *raw materials, developed and undeveloped, in Virginia, are sufficient in quantity and quality, in nearly every portion of the State, to supply the elements for almost every known form of manufacturing industry, even when conducted on the most extensive scale.*

A perusal of the chapter descriptive of Virginia, and a study of the accompanying maps and sections, must convince any one that a State so permeated by rivers,

having their sources in elevated mountain ranges where the deposition of moisture is almost constant, and that descend through not only hundreds, but thousands of feet in their long way to the sea, crossing successive steps or "benches" of country, and having their general course at right angles to the highly inclined rock formations of every section of the State above Tidewater, must furnish an almost unlimited quantity of water-power, while in Tidewater the regular flow of the tides, the fall of the smaller streams and the steady movements of the air, furnish an abundance of natural motive power. The supply of wood and coal for fuel may be stated as inexhaustible, as the forests here renew themselves without man's aid, and the 59,000 square miles of the Appalachian Coal Basin confront her whole western boundary. A large area of this, as well as of the Triassic Coal Basins, lies within the State. No part of the State has any lack of means for producing power to propel machinery.

As an example of the water-power in Virginia, the James river may be instanced. In the ten miles from the head of tide to Boshers's dam, this river falls 130 feet and has, by estimation, a constant average of 44,800 horse-power. Less than 2,000 of this power is now used for the extensive manufacturing establishments of Richmond and Manchester. It is well to repeat that this great surplus power is in the midst of a fertile and healthy region, where the climate is favorable for work the year round, where timber, coal and other raw materials are near at hand, and where sea-going vessels drawing fourteen feet of water can come to the very doors of the manufacturing establishments, and where a canal that penetrates for 200 miles a region rich in agricultural and mineral resources has its tidewater terminus. Following up this broad and deep river, by the line of the completed James River and Kanawha Canal, there is found a fall of 513 feet, including the 130 above mentioned, in the 145 miles between Richmond and Lynchburg,* distributed among the fifty-one locks of the canal, located along the river, between the points named, furnishing a very large amount of water-power, already under control by the dams constructed for the canal, and that can be had for manufacturing purposes at a nominal rent. In the thirty miles between Lynchburg and the western base of the Blue Ridge the fall is 193 feet, also locked and dammed, and in the twenty-one miles more to Buchanan, in the Valley, the present terminus of the canal, 196 miles from Richmond, the fall is over 130 feet. At Clifton Forge, 227 miles from Richmond, the place to which the canal will probably be soon completed to a junction with the Chesapeake and Ohio Railroad, this river is 1,036 feet above mean tide. At Covington, also on the Chesapeake and Ohio Railroad, 243 miles from Richmond by the river, the water is 1,246 feet above tide, and the river is still a very considerable stream, affording fine water-power. In the sixty miles from Covington to the head of Jackson's river, the true James, there is fully a thousand feet more of available fall. No mention has been made of the numerous large and small affluents of the James, shown on the maps, all descending from high levels and contributing to that stream from all directions. It will hardly be considered an exaggeration, in view of the known facts, to say that more than 100,000 available horse-power is now running to waste in the waters of the James alone.

* At Lynchburg the James is six hundred feet wide, and has an average depth of four feet.

The rivers that originate in Middle Virginia have from 200 to 500 feet of available fall; those in Piedmont from 300 to 800; those in the Blue Ridge, in the southwest, many hundred; the streams of the Valley have from 500 to 1,500 feet of descent that can be utilized; and those of Appalachia fully 1,000 feet. The waters of the Potomac, including the Shenandoah, those of the Rappahannock, the Pamunkey, the Appomattox, Roanoke, the Kanawha or New, and the branches of the Tennessee, may be especially mentioned in connection with those of the James as having large amounts of good water-power. Excellent mill-seats may be found in all portions of the State.

The chapter on Climate presents the facts which show that Virginia has a medium climate, especially fitted for manufacturing pursuits. It is rarely that the streams are frozen, and many operations can here be carried on in the open air that elsewhere must have not only shelter, but artificial heat provided for their successful prosecution. The maps of the United States Statistical Atlas, Plate XLI., show that no portion of the United States north of latitude 35° is more free from consumption than Virginia, while most of the State is in the favored belt. From malarial diseases the deaths, by the same authority, Plate XLII., are less than 100 in 10,000 in almost the entire State; most of Tidewater is in the belt of 250 to 550 in 10,000. No portion of the State is depicted as having the worst malarial districts, and nearly all of it is in the most *highly favored* areas in the United States. Plate XLV. brings to similar conclusions in regard to intestinal diseases, most of the State being in the area of 250 deaths in 10,000 from this class of diseases. By Plate XLVI. no part of the Union suffers less from enteric, cerebro-spinal and typhus fevers, a large portion of the State having less than 250 deaths in 10,000, and more than half of it from 250 to 550 from this class of diseases. These carefully compiled maps, published by authority of the General Government, settle the character of Virginia as that of an extremely healthy country.

An inspection of the maps and a perusal of the chapters on Commerce and Internal Improvements will show that Virginia is admirably situated with reference to all the great markets of the country, being midway on the Atlantic coast, penetrated by broad arms of the sea that bring ships farther inland than those of any other Atlantic State, and everywhere intersected by lines of railway having connections with every part of the country. It may be safely asserted that the ways to and from the sea (always the ways of industrial activity) through Virginia territory are, naturally, more numerous and command a larger area than those of any other State. When a few short intervals in lines of communication are filled up, every part of the State will have excellent facilities for traffic.

The desire is general to promote manufacturing industries, that the stores of raw materials may be utilized and a market at home be secured for the products of the soil. Such being the almost unanimous wish of the people, the Legislature is disposed to foster manufacturing enterprises to the extent of its constitutional ability.

The chapter on Population shows that Virginia has, in proportion to her population, a very large number of able-bodied males of the active age, and the experience of those that have used the labor here so abundant, under sensible management and vigilant oversight, essentials to success everywhere, proves that it is of the best kind.

especially for the heavier and coarser sorts of manufactures. There are no more successfully conducted manufactures than those of tobacco, iron, &c., in Virginia. Laborers of the better class are also numerous, and Virginia is but a few hours from the great centres of population in the United States, and but a few days' sail from Europe. The number of laboring animals (see Chapter IV.) is here very large, and the conditions are very favorable for a cheap and continuous supply.

The large agricultural resources of the State, and the numbers engaged in farming, grazing, &c., and its commercial location, making it an outlet for the products of the West, insure to this region an abundance of cheap food. The materials for building are so plentiful and such is the character of the climate, that cheap and comfortable houses can be readily had. The prices current show that Virginia can furnish *food, fuel, clothing, and a home*, as cheaply as any portion of the United States; and ample provision has been made for educational and religious instruction. (See chapters on Education and Religion).

For the MANUFACTURE OF IRON Virginia has especial advantages—the varieties of ore are numerous, the quantity great and the quality good; fuel, wood for charcoal, soft bituminous coal for coke, and splint or block coal to use raw, is plentiful and very accessible, and therefore cheap.

The following estimate of the cost of making pig iron (1875) was made by a Pennsylvania company for a site in Amherst county, in Piedmont, on the James River and Kanawha Canal:

Two tons ore @ \$1, delivered.....	\$ 2 00
One and a half tons Anthracite coal @ \$6.50 per ton.....	9 75
Limestone	25
Labor.....	3 25
Interest, &c., per ton of iron made.....	1 00
Cost at furnace	\$16 50
Freight, canal, &c., to Philadelphia.....	2 50
Total cost in Philadelphia.....	<u>\$19 00</u>

A report prepared in reference to iron manufacturing in Staunton, in The Valley, in 1875, gives the following estimates for materials delivered: Iron ores yielding from 35 to 58 per cent. metallic iron, requiring $2\frac{1}{2}$ tons of crude ore per ton of iron of 2,240 pounds, \$1.25 to \$2.50; limestone per ton, 50 cents; New River coke (containing 91.7 to 93.8 per cent. pure carbon and but $\frac{1}{8}$ of 1 per cent. of sulphur), requiring from $1\frac{1}{2}$ to $1\frac{3}{4}$ tons per ton of iron per long ton, \$5. The estimated cost of a long ton of pig, made at Staunton, was \$17.25. That was the *actual* cost, including everything, at Quinimont, West Virginia, on the Chesapeake and Ohio Railroad, it was stated by the manufacturers.

The American Iron and Steel Association in a late report says, speaking of Virginia and adjacent States, they are "rich in iron ore, much of it of the best quality; * * possess vast deposits of bituminous coal. Labor is abundant and cheap; access to iron markets is not difficult—so that, with sufficient capital, enterprise and skill, the manufacture of pig iron and bar iron may be pursued successfully and profitably."

In 1874, Mr. Harriss-Gastrell, of the British Embassy at Washington, made a

voluminous and able report to his government on the Iron and Steel Industries of the United States, in which frequent reference is made to Virginia. On page 176 he states that he had been informed that ores can be mined and put on the cars at from 50 cents to \$1 per ton. On page 178 the following statement is made as to the cost of a ton of Bessemer steel ore from fifty miles west of Richmond:

Cost of mining, &c.....	\$1 00
Royalty	50
Freight to Richmond.....	1 00
Hauling to station, through Richmond.....	1 00
Freight to Philadelphia.....	1 50
Incidentals.....	1 00
Total.....	<u>\$6 00</u>

“The above computation would, at the recent prices of such ores in the Anthracite districts of Pennsylvania, have left a large margin for interest, sinking fund and profit.”

On page 200 he says “the cost of labor per ton of ore appears to be, for the United States, about \$2: Michigan shows \$1.83 per ton; New York shows \$2.05; New Jersey nearly \$3; and Pennsylvania about \$1.87 per ton. In Virginia the cost of labor per ton is only 77 cents; in Wisconsin, Iron Ridge ores mainly, only 92 cents; and in Missouri nearly \$1.40; while North Carolina runs it up to \$3.60.” On page 201 it is stated that materials per ton cost, for the United States, about 37 cents: for Michigan, 50 cents; for New York, 44 cents; for New Jersey, 47 cents; for Pennsylvania, 35 cents; and for Ohio, 31 cents. “In Virginia the cost of material appears to be less than 15 cents.” The value of the ore per ton is given as \$1.92 in Virginia; \$4 in New York; \$3.60 in Pennsylvania; \$2.20 in Missouri, &c. On page 212, in estimating the cost of production at exporting points of ores, this “blue book” makes the cost in the Lake Superior and Missouri regions, in 1873, about \$4 per ton; in the Lake Champlain, from \$3.50 to \$4; in Pennsylvania, \$2.50; and in the South, \$2. On page 270 a table of weekly wages of furnace hands is given, with the following result for the “Richmond district, in Virginia,” viz: keeper, \$15; guttermen, \$12; fillers, ore-breakers and wheelers, \$10 each; foreman, \$30; engineer, \$16; hours of labor per week, 84. For the Pittsburg, Pennsylvania, district the figures are: keeper, \$26; helper, \$19.50; fillers, \$15.75; ore-breakers and wheelers, \$9.60; coal-rackers or common laborers, \$7.20; foreman, \$30; engineer, \$31.50; hours of labor, 84. The cost of making a ton of iron in Pittsburg is given on page 273 as \$30.73, from ordinary ores. On page 278 a statement is made as to cost of material and labor in Virginia, confirming previous ones. On page 282, in conclusions on iron manufacture in the South, the report says: “The fact seems to be that coke pig iron can be made for from \$15 to \$18, and on an average for \$16, including interest on original outlay, and a fair profit on ores and fuel.” On pages 292 and 302 statements given show how cheaply charcoal iron can be produced in Virginia. On page 606 the cost of materials for a ton of nails is given as \$58.75, in Virginia, or less than in any other State; in Pennsylvania it was \$76.55; in Missouri, \$79.08.

ADDITIONS TO SECTION I—RESULTS OF MANUFACTURES.

The following tables and remarks are from an article by George Baughman, Esq., in Hunt's Merchants Magazine of New York, for January, 1859, Volume XL. They were compiled with great care, from data collected at the establishments, and present a much better exhibit of the manufacturing and mechanical industries of Richmond in 1858 than the census returns of 1860, before given, do for the year 1859:

Manufacturing and Mechanical Statistics of Richmond for the year 1858.

	Number of Es- tablishments.	No. of Hands Employed.	Value of Tools and Machinery.	Value of Real Estate Occu- pied.	Amount of Sales
Tobacco—Chewing.....	53	4,052	\$ 515,000	\$ 636,000	\$ 6,228,496
Smoking.....	.....	300	20,000	12,000	22,000
Stemmeries.....	6	600	3,000	30,000	187,500
Cigars.....	8	21	.....	16,000	22,932
Flour.....	7	375	400,000	650,000	4,643,637
Corn meal.....	8	38	8,000	53,000	221,000
Iron rolling mills.....	2	410	158,000	192,000	481,500
Iron and steel mill.....	1				
Foundries and machine shops.....	7	650	191,000	212,000	795,000
Architectural foundry.....	1	14	5,000	7,500	15,000
Stove foundry.....	1	16	8,200	10,000	15,000
General foundry.....	1	12	3,500	3,000	12,000
Railroad machine shops.....	4	159	34,750	66,000	78,173
Shapening mills.....	2	16	4,375	3,250	17,500
Iron railings.....	6	42	7,500	22,000	40,000
Nails.....	1	175	.....	* 150,000	237,500
Blacksmiths.....	42	126	12,600	82,000	126,000
Bell and brass founders.....	1	6	2,000	1,500	5,000
Coppersmith.....	1	14	6,000	7,500	14,000
Saw maker.....	1	10	2,000	8,000	15,000
File maker.....	1	4	1,000	3,000	4,000
Tin ware, stoves, plumbing and lightning rods.....	12	91	10,000	87,500	220,000
Silver plater.....	1	4	400	1,500	4,000
Agricultural implements and foundries.....	6	105	10,000	50,000	200,000
Book binders.....	6	36	3,900	20,000	53,500
Bakeries.....	30	126	5,000	131,000	300,000
Boot and shoe makers.....	.....	238	7,075	75,000	253,000
Brush makers.....	2	3	200	2,000	2,000
Boxes—merchandise packing.....	2	7	500	4,000	5,211
Boxes and cases—tobacco.....	.....	90	1,000	50,000	250,852

* Capital.

Manufacturing and Mechanical Statistics Continued.

	Number of Es- tablishments.	No. of Hands Employed.	Value of Tools and Machinery.	Value of Real Estate Occu- pied.	Amount of Sales
Bottling—soda, ale and beer.....	6	36	\$ 4,500	\$ 12,500	\$ 40,310
Butchers.....	48	96	.....	120,000	557,151
Building—Brick making.....	7	210	5,000	69,000	143,500
Brick laying.....	13	225	25,000	19,000	300,000
Carpenters.....	37	295	20,450	143,000	330,000
Plasterers.....	12	70	700	2,000	76,000
Painters.....	23	106	1,900	17,250	76,500
Sash, blind and door makers.....	5	35	1,200	9,800	24,500
Mouldings.....	.....	6	1,000	3,000	6,000
Planing mills.....	2	30	10,000	30,000	60,000
Slater.....	1	10	300	2,000	10,000
Saw mill.....	1	16	3,500	5,700	29,400
Architectural plaster ornaments.....	1	3	500	2,000	3,000
Architects.....	5	11	2,500	10,000	10,000
Stone cutters.....	3	24	600	36,000	12,600
Marble cutters.....	3	40	2,100	36,500	60,000
Cabinet makers.....	13	105	2,000	52,500	346,000
Carriage makers.....	11	185	5,000	78,000	239,000
Clothing.....	60	420	2,000	.....	459,000
Coopers.....	11	305	25,000	42,000	220,000
Confectioners.....	26	48	3,000	42,000	83,333
Carver—wood.....	1	1	.....	420	750
Cotton factories.....	2	460	122,500	169,000	435,000
Cedar and willow ware.....	2	6	.....	5,000	3,000
Curriers.....	2	13	1,000	17,000	205,000
Dyeing.....	3	14	3,000	12,500	14,000
Distillery.....	1	75	40,000	20,000	260,000
Gas works.....	1	60	.....	283,000	107,085
Gunsmiths.....	.....	20	5,000	20,000	30,000
Glass works.....	1	55	2,000	15,000	40,000
Hatters.....	.....	21	1,000	4,000	65,000
Jewelry makers and repairers.....	.....	50	2,500	10,000	60,000
Ivory cutters and carvers.....	2	4	500	2,000	4,000
Lime burners—shell.....	2	6	1,000	.....	20,900
Lock maker.....	1	5	1,100	4,500	8,900
Lock repairers.....	3	4			
Looking glass and frame.....	2	5	300	9,000	4,000
Lard refinery.....	1	4	2,000	10,000	5,000
Leather belting and hose.....	1	2	1,000	2,500	10,000

Manufacturing and Mechanical Statistics Continued.

	Number of Es- tablishments.	No. of Hands Employed.	Value of Tools and Machinery.	Value of Real Estate Occu- pied.	Amount of Sales
Millwright.....	.....	25	\$ 2,500	.....	\$ 26,000
Millners and mantua makers.....	60	400	.....	40,000	117,000
Paper mill.....	1	40	25,000	30,000	60,000
Plaster mills.....	2	14	5,700	8,000	28,000
Paper hanging and upholsterers.....	3	29	.....	23,000	111,500
Phosphate of lime.....	1	8	500	2,000	12,000
Piano makers.....	2	12	1,000	8,000	9,500
Plumbers.....	2	4	.....	4,000	3,000
Penitentiary—sundries.....	1	.....	10,043	.....	81,383
Stoneware.....	1	12	500	10,000	10,000
Saddle and harness makers.....	8	78	.....	48,000	120,000
Soap and candle makers.....	5	40	15,000	24,500	115,000
Sail maker.....	1	11	.....	2,000	12,000
Tannery.....	1	4	2,500	3,500	6,000
Turners.....	4	12	1,200	6,000	10,000
Umbrellas.....	.....	5	100	3,000	2,500
Wheelwrights.....	15	45	1,500	15,000	20,000
Water works.....	1	.....	.....	350,000	32,273
Printing—book and job.....	9	207	136,500	125,350	272,500
Printing—newspaper and periodical.....	16				
Total.....	.....	11,811	\$1,819,193	\$4,609,270	\$19,878,896

Deduct value of manufactures included in the above, not the products of Richmond, viz:

Agricultural implements.....	\$ 15,000
Furniture.....	120,000
Carriages.....	60,000
Leather.....	130,000
Guns, &c.....	15,000
Paper Hangings.....	40,000
	<u>\$390,000</u>
Total product of Richmond.....	<u>\$19,488,896</u>

RECAPITULATION.

Different kinds of manufacturing and mechanical establishments.....	91
Number of persons employed—i. e., principals, clerks and operatives.....	11,811
Amount of capital invested in necessary tools and machinery.....	\$1,819,193
Amount of capital invested in real estate occupied by establishments.....	4,609,270
Total amount of products in twelve months.....	19,488,896

No estimate was made of the capital invested in raw materials.

Artistic.

	Number of Es- tablishments.	No. of Hands.	Value of Tools and Machinery.	Value of Real Estate.	Amount of Sales
Ambrotypes and photographs.....	7	17	\$ 3,000	\$ 32,000	\$ 28,000
Portrait and landscape painters.....	.....	3	.....	.....	.....
Artistic founders.....	.....	1	.....	.....	4,000
Total.....	7	21	\$3,000	\$32,000	\$32,000

Comparison of Richmond with other American Cities.

	PRODUCTS OF MANUFACTURES.				COMPARISON OF POPULATION, PROPERTY, &c.			
	Year.	Value of Manu- factures per capita of Pop- ulation.	No. of Hands Employed.	Amount to each Hand Employ- ed.	Year.	Population.	Real and Per- sonal Property.	Per Head.
Philadelphia	1850	\$148	66,474	\$ 910	1854	480,000	.....	.....
New York.....	1850	204	83,620	1,258	1855	625,000	\$487,060,838	\$ 779
Boston	1855	319	Not stated.	.....	1855	162,629	241,932,200	1,420
Buffalo	1855	137	6,820	1,491	1855	74,214	33,037,711	445
Chicago	1857	119	10,573	1,467	1857	130,000	36,256,249	279
Richmond	1858	433	11,811	1,650	1858	{ 30,000 white 15,000 black	47,802,719	1,593
Detroit.....	....	....	.....	.....	1854	40,373	12,524,095	310

“By a comparison of the list of our manufactures with any of the above cities, the difference in the average to each hand will be seen chiefly to be in our milling business, in which 375 hands turn out over four and a half million dollars; and this illustrates another great advantage we enjoy in our great water power, and still another in being at the outlet of an interior which produces the only wheat, the flour from which has always been shipped to extreme southern latitudes without spoiling. The advantages of Richmond over the cities named above, as a manufacturing locality, is without question. She has them in her immense water power, in her immediate vicinity to an almost illimitable field of the best coal, and in her great convenience to the very best iron ore, leaf tobacco, wheat, cotton, and almost every other kind of raw material.”

General Recapitulation of Business, &c., of Richmond for 1858.

	Number of Hands.	Value of Tools and Machinery.	Value of Real Estate Occupied.	Value of Products.
Manufacturing and mechanical.....	11,811	\$ 1,819,193	\$ 4,609,270	\$ 19,488,896
Artistic	21	3,000	32,000	32,000
Merchandising.....	2,384	.....	3,962,800	37,142,826
				\$56,663,722
Auction sales of real and personal property.....	61	.....	88,000	7,665,180
Live stock.....	54	.....	20,000	290,837
Industrial	740	312,580	152,500	599,101
Miscellaneous.....	495	.....	392,000	839,025
Professional.....	287	139,900	310,000	394,450
Inspectors, &c.....	426	.....	.....	270,807
Total.....	10,279	\$2,274,673	\$9,566,570	\$66,723,115

"No place in the State, and but few, if any, in the whole country, possess greater natural advantages for productive industry. With a mild and equable climate and healthful locality, with complete railroads and canal of nearly 1,000 miles, radiating from Richmond, penetrating forests, mines, grazing and agricultural districts, abounding in every variety of raw material for the loom, anvil, buhr, screw, saw, &c., and by their connections, giving quick and cheap access to the products of the South and Southwest generally, and with an unobstructed outlet by the river to the ocean for coastwise and foreign export, and with an almost-unlimited demand for every article of merchandise and manufacture, we really believe that Richmond has scarcely a parallel for combined manufacturing and commercial advantages."

A recent* British "Blue Book" gives these returns of IRON AND STEEL MANUFACTURES IN VIRGINIA for 1869-'70:

In *making and repairing railroad cars*, there were employed 7 establishments, using 7 steam engines with 250 horse-powers, 1 water wheel with 70 horse-power, 469 men, and having \$1,205,600 invested capital, paying \$258,578 for wages, and \$330,458 for materials, the products being worth \$613,036. The products of forged iron were valued at \$42,750. In *making machinery*, 28 establishments were at work, using 15 steam engines with 223 horse-powers, 3 water wheels with 124 horse-powers, working 501 men and 22 boys, having \$714,527 capital invested, paying \$214,723 in wages, and \$238,963 for materials, producing 13 boilers, 14 stationary engines, 160 tobacco presses and machines, 2 water wheels, doing \$480,182 worth of miscellaneous and repair work, producing in all \$591,182. In *iron casting*, 54 establishments were engaged, 15 using 245 horse-powers of steam engines, and 19 using 388 horse-powers of water wheels; 57 cupola furnaces were used, having a daily capacity of 127 tons of melted metal; 541 men and 12 boys were employed; the capital invested was \$554,235, and \$199,275 were paid for wages, using 5,547

* Report of Mr. Harriess-Gastrell, of British Legation, on Iron and Steel Industries in the United States, 1874.

tons of pig iron, valued at \$199,788, and 2,995 tons of scrap iron, worth \$79,141, with 6,242 tons of coal, costing \$42,521, and other materials \$2,312—a total for materials of \$323,762—producing 5,300 car wheels, 700 feet of railing, \$4,835 worth of hollow-ware, 1,890 stoves, 1,059 tons of agricultural castings, and 5,344 tons of miscellaneous castings, all valued at \$762,274. In the *manufacture of nails*, Virginia had one establishment using 2 water wheels having 100 horse-power, working 160 men, with \$125,000 invested capital, paying \$722,460 for wages, using 4,000 tons of plate iron and 50 tons of coal, the materials all costing \$224,200, producing 3,950 tons of nails valued at \$350,000, the materials for a ton costing \$58.75, the labor \$21.55, and the value was \$88.90; the materials cost less than in any other State. In *manufacturing iron, and articles from it*, Virginia had 89 establishments, using 25 steam engines with 735 horse-powers, 58 water wheels with 1,986 horse-powers, employing 2,338 men, 4 women and 72 youths, with \$2,318,635 invested capital, paying \$833,660 for wages and \$2,027,590 for materials, producing to the value of \$3,605 940.

CHAPTER VI.

THE COMMERCE OF VIRGINIA.

SECTION I.—COMMERCIAL RESULTS.

In 1870 only about 1-20th (4.89 per cent.) of the people of Virginia were employed in trade and transportation, while the average proportion for the United States was 9.52 per cent. This may be assumed to have been the usual proportion. Therefore, notwithstanding the great advantages the State possesses in resources and location, the commercial results she can present are comparatively meagre, although other communities have grown rich from the traffic drawn from her borders.

In 1870 the population of Tidewater Virginia was 346,305, and of these only 3,387 were reported as engaged in trade and transportation, of which number only 2,805 were natives of the State.

The FOREIGN COMMERCE of Virginia has been generally confined to the exportation of raw materials. Most of the imports consumed in the State have reached it through Baltimore, Philadelphia and New York.

Mr. Jefferson, in his "Notes on Virginia," gives the following exhibit of the *Average Export Trade* of the State (taking one year with another) *previous* to the Revolution of 1776:

No. 1.

ARTICLES.	QUANTITY.	PRICE.	AMOUNT.
Tobacco	55,000 hhd. of 1,000 lbs.	\$ 30 per hhd.	\$ 1,650,000
Wheat	800,000 bushels.	\$5-6 per bush.	666,666⅔
Indian corn.....	600,000 bushels.	\$ ⅔ per bush.	200,000
Shipping.....	.....	.....	100,000
Masts, planks, scantling, shingles and staves.....	.....	.....	66,666⅔
Tar, pitch and turpentine.....	30,000 barrels.	\$1½ per barrel.	40,000
Peltry, viz: skins of deer, beavers, otters, musk- } rats, raccoons and foxes..... }	180 hhd. of 600 lbs.	\$5-12 per lb.	42,000
Pork	4,000 barrels.	\$10 per barrel.	40,000
Flax seed, hemp and cotton.....	.....	.....	8,000
Pit coal, pig iron.....	.....	.....	6,666⅔
Peas	5,000 bushels.	\$ ⅔ per bush.	3,333⅔
Beef.....	1,000 barrels.	\$3½ per barrel.	3,333⅔
Sturgeon, white shad, herring.....	.....	.....	3,333⅔
Brandy from peaches and apples, and whiskey...	.....	.....	1,666⅔
Horses.....	.....	.....	1,666⅔
(This sum is equal to £850,000 Virginia money—607,142 guineas).		Total.....	\$2,633,333⅔

Previous to the war of 1812 Norfolk monopolized most of the trade of the British West Indies, and derived much profit from it. This trade subsequently revived, but has not as yet assumed its former proportions. Doubtless, now that interior communications have been generally established, it will again seek its best distributing points for its largest customers through Virginia ports.

During the fiscal year ending September 30th, 1831, the domestic* exports of Virginia were valued at \$4,149,986, and the imports at \$488,552.

In 1840 the domestic† exports of the State amounted to \$4,778,220, and the imports to \$545,685, and 31 commercial and 64 commission houses, with a capital of \$4,299,500, were engaged in foreign trade.

The official reports of the Bureau of Statistics, in the Department of the Treasury of the United States, on Commerce and Navigation, have furnished the commercial information here given, unless otherwise stated.

No. 2.

Statement Showing the NUMBER of AMERICAN and FOREIGN VESSELS, with their TONNAGE and CREWS, that ENTERED Virginia Ports from Foreign Countries during the Fiscal Years 1858 to 1860, and 1866 to 1874.

YEAR.	AMERICAN VESSELS.			FOREIGN VESSELS.			AGGREGATE.			Proportion to Whole Tonnage Entering U. S. (in round numbers).
	Number.	Tons.	Crews.	Number.	Tons.	Crews.	Number.	Tons.	Crews.	
1858	165	73,422	2,337	94	18,910	733	259	102,332	2,070	1-66th.
1859	139	62,781	.....	97	26,556	.....	236	89,337	.....	1-89th.
1860	185	80,977	.....	88	16,785	.....	273	97,762	.....	1-84th.
1866	15	3,101	38	38	15,923	.....	53	19,024	.....	1-432nd.
1867	36	15,845	.....	31	10,530	.....	67	26,375	.....	1-288th.
1868	20	6,840	212	43	13,686	433	63	20,526	695	1-374th.
1869	19	3,273	119	33	9,790	318	52	13,063	437	
1870	42	7,495	268	26	7,778	263	68	15,273	531	1-611th.
1871	32	7,083	231	21	10,104	370	53	17,187	601	1-625th.
1872	16	5,324	140	74	51,140	2,236	90	56,464	2,376	1-192nd.
1873	21	5,440	165	80	55,568	2,650	101	61,008	2,815	1-195th.
1874	65	16,993	472	45	27,670	1,060	110	44,663	1,532	1-291th.

The items for 1858 show the condition of the trade of the State previous to the late war (1861-'65), during which the commerce and shipping of the State were completely destroyed. The other years show a gradual return of prosperity, when compared with the whole country.

In 1874 more details were given, and the reports state that the entries, *with cargoes*, were of American vessels 63, with 15,971 tons and 439 in crews, and of foreign vessels 33, with 21,704 tons and 884 in crews. The entries *in ballast* were 2 American vessels, with 1,022 tons and 33 in crews, and 12 foreign vessels, with 5,966 tons and 140 in crews.

* Martin's Gazetteer, 1835.

† Howe's Historical Collections of Virginia, 1845.

No. 3.

Statement Showing the NUMBER of AMERICAN and FOREIGN VESSELS, with their TONNAGE and CREWS, that CLEARED from Virginia Ports for Foreign Countries during the Fiscal Years 1858 to 1860, and 1866 to 1874.

YEAR.	AMERICAN VESSELS.			FOREIGN VESSELS.			AGGREGATE.			Proportion to Whole Tonnage Cleared from U. S. (in round numbers).
	Number.	Tons.	Crews.	Number.	Tons.	Crews.	Number.	Tons.	Crews.	
1858	217	66,766	2,095	100	21,878	897	317	88,644	2,992	1-79th.
1859	205	65,377	.....	95	19,371	.....	300	84,748	.....	1-94th.
1860	180	59,611	.....	88	20,770	.....	268	80,381	.....	1-110th.
1866	13	5,949	.....	49	20,095	.....	62	26,044	.....	1-326th.
1867	32	6,800	.....	40	19,564	.....	72	26,364	.....	1-328th.
1868	53	15,479	499	57	19,370	699	110	34,849	1,198	1-259th.
1869	58	18,370	522	67	19,641	657	125	38,011	657	
1870	41	9,906	321	66	22,239	746	107	32,145	1,067	1-286th.
1871	43	10,192	319	49	13,435	446	92	23,627	765	1-412th.
1872	76	19,270	624	64	22,886	718	140	42,156	1,342	1-256th.
1873	71	20,050	571	69	26,661	891	140	46,711	1,462	1-246th.
1874	80	25,517	680	78	39,466	1,102	158	64,983	1,782	1-206th.

Of the vessels that cleared in 1874 *with cargoes*, 80 were American, having 25,517 tons and 680 in crews, and 77 were foreign, having 39,019 tons and 1,091 in crews. The departures *in ballast* were 1 foreign vessel of 447 tons, with 11 in its crew.

No. 4.

Statement Showing the NUMBER of AMERICAN and FOREIGN OCEAN STEAM VESSELS, with their TONNAGE and CREWS, that CLEARED from Virginia Ports for Foreign Countries, and that ENTERED from Foreign Countries, during the Fiscal Years 1870, 1871, 1872, 1873, 1874.

Year.	CLEARED.									ENTERED.									Proportion to Whole Entering U. S.
	AMERICAN.			FOREIGN.			TOTAL.			AMERICAN.			FOREIGN.			TOTAL.			
	Number.	Tons.	Crews.	Number.	Tons.	Crews.	Number.	Tons.	Crews.	Number.	Tons.	Crews.	Number.	Tons.	Crews.	Number.	Tons.	Crews.	
	Number.	Tons.	Crews.	Number.	Tons.	Crews.	Number.	Tons.	Crews.	Number.	Tons.	Crews.	Number.	Tons.	Crews.	Number.	Tons.	Crews.	
1870	..	....	..	1	1,442	46	1	1,442	46	..	..	..	..	.....	.....	..	.....	.....
1871	..	....	..	..	.....	....	..	.....	....	..	....	..	3	4,423	195	3	4,423	195	1-666th.
1872	2	331	12	2	3,275	96	4	3,606	108	2	269	17	17	26,807	1,505	19	27,076	1,522	1-118th.
1873	..	....	..	8	10,488	317	8	10,488	317	..	....	..	25	38,488	2,075	25	38,488	2,075	1-107th.
1874	1	212	20	7	11,866	306	8	12,078	326	1	213	18	7	13,170	664	8	13,383	682	1-360th.

All these clearances and entrances were through the port of Norfolk, which has every advantage that can be desired for the arrival and departure of the *largest* ocean steamships. The water at the wharves of Norfolk is always deep enough to permit the largest vessels to come alongside.

No. 5.

Statement of the VALUE OF IMPORTS from, and DOMESTIC EXPORTS to, Foreign Countries through Virginia Ports, Specifying the Country, during the fiscal years named.

COUNTRY FROM AND TO WHICH.	1869.		1870.		1871.		1872.		1873.		1874.	
	Imports.	Exports.	Imports.	Exports.	Imports.	Exports.	Imports.	Exports.	Imports.	Exports.	Imports.	Exports.
Nova Scotia, N. Br. and Pr. Ed. Is.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Quebec.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dominion of Canada.....	8,543	47,205	11,967	14,526	10,556	.....	4,761	.....	5,488	11,087	19,269	20,935
Other British North American Possessions.....	1,085	.....	.....	.....	.....	.....	.....	.....	702	.....	.....	.....
Mexico.....	.....	.....	.....	.....	.....	.....	25,000	.....	.....	.....	.....	.....
Central American States.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cuba.....	10,551	30,538	25,212	26,745	7,995	28,506	.....	1,450	.....	.....	.....	.....
British West Indies.....	5,591	326,124	.....	169,220	380	198,937	515	40,294	.....	96,638	.....	37,045
Danish West Indies and Aa. Possessions.....	.....	18,000	.....	.....	31,213	.....	.....	275,043	1,570	174,325	46,881	140,202
French West Indies and French Poss. in Aa.....	.....	17,997	.....	16,060	.....	.....	.....	19,222	.....	10,865	.....	5,963
United States of Colombia.....	.....	.....	.....	.....	.....	.....	.....	5,460	.....	94,032	.....	2,295
British Guiana.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5,370	.....	.....
Brazil.....	.....	370,138	.....	621,023	.....	548,167	.....	958,791	.....	50,929	.....	80,955
Uruguay.....	.....	1,206	.....	.....	.....	.....	.....	204,904	44,030	1,119,653	83,609	1,423,901
Argentine Republic.....	6,538	.....	.....	38,393	.....	.....	.....	.....	.....	.....	.....	.....
England.....	179,309	1,386,719	103,708	1,647,875	188,631	447,100	587,672	580,376	856,940	1,108,146	181,979	1,108,406
Scotland.....	45,370	.....	.....	.....	.....	.....	.....	.....	13,494	43,552	4,340	123,847
Ireland.....	.....	.....	.....	24,750	.....	101,637	.....	142,357	.....	14,010	.....	198,808
Holland.....	.....	.....	.....	.....	.....	.....	.....	3,110	.....	.....	.....	418,329
Netherlands.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bremen.....	.....	69,754	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Germany.....	.....	.....	.....	.....	.....	.....	.....	84,565	.....	* 131,953	.....	.....
Austria.....	.....	114,700	.....	279,400	.....	169,400	.....	314,600	.....	495,800	.....	530,000
France.....	.....	418,328	.....	130,000	.....	452,400	.....	602,141	.....	.....	.....	516,097
Italy.....	.....	436,340	.....	15,251	.....	68,885	.....	261,765	.....	134,290	.....	267,058
Spain.....	.....	35,591	66	.....	.....	.....	.....	10,309	.....	58,599	.....	34,214
Portugal.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	46	.....
Azores, Madeira, &c.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	449	3,600
Total.....	\$259,749	\$3,307,450	\$141,313	\$2,983,258	\$177,562	\$2,046,310	\$627,948	\$3,218,387	\$922,861	\$3,478,607	\$336,566	\$5,299,670

* 20,000 a re-export.

These summarized returns of the Bureau of Statistics give only the values of imports and exports, not the articles. To find out what the State trades in with other countries, other sources of information must be sought. The facts* of the trade of Richmond are the only ones accessible, but from those for one or two years, compared with Statements 5 and 6, a very good idea of the general trade may be formed. The cotton statement, hereafter given, will also help to show the courses of Virginia trade.

ARTICLES* AND VALUES of DIRECT TRADE of RICHMOND during the Fiscal Year 1872.

IMPORTS.		EXPORTS.	
<i>From Nova Scotia:</i>		<i>To France:</i>	
227 boxes smoked herrings.....	\$25	2,033 hhds. leaf tobacco.....	\$318,153
980 tons lump plaster.....	861	1,010 bags oak bark.....	1,000
		790 bags quercitron.....	1,155
		6,000 staves.....	420
			\$320,728
<i>From England:</i>		<i>To Austria:</i>	
7,558½ tons iron rails (old).....	239,613	2,214 hhds. leaf tobacco.....	\$487,450
3,052 tons iron rails (new).....	19,801		
193,636 lbs. bar iron.....	3,289	<i>To Brazil:</i>	
57,617 sacks salt.....	47,327	87,069 bbls. flour.....	786,022
3,446 gals. ale and porter.....	3,643	832 bbls. rosin.....	2,125
145 gals. brandy.....	273	30 bbls. pitch.....	149
441 gals. gin.....	254	500 kegs lard.....	2,513
512½ gals. whiskey.....	463	84 bundles of window frames..	475
492½ gals. sherry.....	571	Hams, boards, hooks, hard- ware and clothing.....	298
592½ gals. claret.....	701		
8 cases champagne.....	44		
12,100 lbs. licorice..... (?)	1,005	<i>To Holland:</i>	
16½ tons coal.....	40	60 hh. ls. tobacco stems.....	\$3,110
6 hounds.....	25		
Furniture.....	629	<i>To Bremen:</i>	
China and earthenware.....	11,472	481 hhds. leaf tobacco.....	75,750
		157 hhds. tobacco stems.....	7,900
		14 boxes manufact'd tobacco..	315
		622 bags quercitron.....	600
			\$84,565
	\$329,155	<i>To Scotland:</i>	
Total imports.....	\$330,041	290 hhds. tobacco strips.....	\$43,552
		<i>To Ireland:</i>	
		9,726 bbls. flour.....	\$63,235
<i>The Direct Imports of Richmond in 1874 were:</i>		<i>To England:</i>	
Coffee from Brazil.....	\$ 223,909	278 hhds. leaf tobacco.....	43,111
Coffee from Venezuela.....	40	1,167 hhds. tobacco strips.....	162,398
Lump gypsum from Nova Scotia.....	7,314	15,000 staves.....	1,000
Guano from Nevassa Islands.....	5,830		\$206,609
Salt from England.....	57,599	<i>To Italy:</i>	
Stout from England.....	1,122	256 hhds. leaf tobacco.....	43,132
Bass mats.....	295	6 boxes manufact'd tobacco..	50
Oil paintings.....	24		\$43,215
Total imports.....	\$296,036	Total exports.....	\$2,049,656

The Richmond trade with European countries is chiefly the exportation of tobacco, tan bark and staves, and the importation of salt, manufactured iron and malt liquors, the import trade being heretofore with England. The trade with Nova Scotia is the exchange of tobacco for lump plaster mined there. Brazil exchanges coffee for the flour of Richmond, that keeps so well in warm climates. naval stores and provisions. The enlargement of the course of direct trade that is taking place, resulting from the exportation of flour, tobacco, cotton, naval stores and other forest products, &c., in large quantities, will soon lead to an increase of imports to supply the sections from which the exports are drawn.

* Report of Richmond Chamber of Commerce, 1874.
Richmond Dispatch, January 1st, 1875.

Summary Statement of DOMESTIC EXPORTS (the Growth, Produce and Manufacture of the

ARTICLES.	1858.		1868.		1869.
	Quantity.	Value.	Quantity.	Value.	Quantity.
Bark for tanning.....		\$ 3,709			
Books		185			
<i>Bread and Breadstuffs:</i>					
Bread and biscuits.....	{ Bbls 3,052 Box's 400 }	11,672	bbls. 810	627	lbs. 24,753
Indian corn.....	Bush. 165,249	114,034	125,152	152,101	81,600
Indian corn meal.....	Bbls. 763	3,146	1,695	10,638	1,769
Wheat.....	Bush. 92,138	119,422			
Wheat flour.....	Bbls. 334,302	2,459,004	29,312	355,480	36,514
Other small grain and pulse.....		9,168		141	
Maizena, &c.....					
Bricks				280	
Brooms, brushes, &c.....				356	
Candles—adamantine.....	Lbs. 16,444	4,063			
Candles—sperm	Lbs. 900	400			
Candles—tallow.....	Lbs.		1,000	100	
Carriages, carts, &c.....					
Cars—railroad, &c.....		(?) 2,200			
Coal—bituminous.....	Tons 1,146	5,131			201
Coal—other.....					
<i>Cotton and Manufactures of:</i>					
Sea Island.....					
Other unmanufactured	Lbs. *213,351	28,976	4,108,510	956,228	2,643,351
Colored manufactured.....		1,355			
Uncolored manufactured.....		11,000			
All manufactures of, not specified.....		5,373			
Drugs, chemicals, &c., not specified.		185		2,957	
Fancy articles, not specified.....					
<i>Fruits:</i>					
Not specified.....				644	
Apples—dried	Lbs.				
Preserved.....					
Glass and glassware.....		129			
Jewelry.....		420			
Hay.....	Tons.				
Hemp—manufactures of.....					
Hoop skirts.....					
India rubber goods.....		200			
<i>Iron and Manufactures of:</i>					
Castings	Cwt. 113	782			

*495 bales.

[illegible]

ARTICLES.	1858.		1868.		1869.
	Quantity.	Value.	Quantity.	Value.	Quantity.
<i>Iron and Manufactures of:</i>					
Boilers for steam engines.....					
Machinery, not specified.....					
Nails and spikes.....Lbs.	10,000	4,000			
All other manufactures of Iron.....		6,948			
<i>Steel and Manufactures of:</i>					
Cutlery					
Edge tools.....					
Fire-arms.....					
<i>Leather and Manufactures of:</i>					
Leather.. ..Lbs.	1,138	301			
Saddlery and harness.....					
Boots and shoes..... Pairs.					
Lime and cement.....					
Matches					
Musical instruments.....					
<i>Naval Stores:</i>					
Rosin and turpentine..... Bbls.	6,167	9,090	12,283	42,577	13,887
Tar and pitch..... Bbls.	2,001	3,256	120	323	1,210
<i>Oils:</i>					
Mineral, crude..... Gals.					
Do. refined..... Gals.					630
Animal, lard..... Gals.					
Do. whale..... Gals.			80	85	
Vegetable, essential.....					
Paints and varnish.....		22			
Paper and stationery.....		775			
<i>Provisions:</i>					
Bacon and hams.....Lbs.	4,498	671	350	73	
Beef.....Bbls.	177	3,418			
Butter.....Lbs.	7,637	1,199	625	225	90
Cheese.....Lbs.	4,440	536	1,617	185	
Condensed milk.....					
Fish—pickled..... Bbls.			87	185	
Fish—otherwise cured.....					
Lard.....Lbs.	45,753	6,040	2,500	475	100
Meats—preserved.....				75	
Oysters.....				1,000	
Pickles					
Pork.....Bbls.	822	14,586			

CONTINUED.

1869.	1870.		1871.		1872.		1873.		1874.	
Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
						1,050				
53,394						100	6			200
						901				
						230	12			5
		125				50				
						25				
					250	498				
						13				
				75						
43,960	4,347	10,090	1,007	2,816	705	3,061	3,617	13,442	427	1,691
2,934	808	1,617	106	332	159	498	520	1,257	20	50
					1,000	250				
305	100	50			2,430	920			20,000	5,000
	215	320								
				80			450			
						70				
					4,588	428	125	20		
	lbs.				lbs.		lbs.			
	1,000	55			1,684	136	1,000	80		
30										
			856	97						
					13					
			50	200						
20				20						
15	3,750	825	150	30	30,596	3,671	33,926	4,054	26,094	2,650
				10						
				94				3,276		
			lbs.							
			10,250	1,025						

ARTICLES.	1858.		1868.		1869.
	Quantity.	Value.	Quantity.	Value.	Quantity.
<i>Provisions :</i>					
Potatoes.....Bush.	75	73			
Vegetables.....					
<i>Rags :</i>					
Cotton.....Lbs.			1,616	100	
Rice.....Trs.	10	269			
<i>Seeds :</i>					
Clover.....Bush.					
Flax.....Bush.			2	7	
Garden.....					
Soap.....Lbs.					
Spirits from grain.....Gals.	1,062	526			
Spirits of turpentine.....Gals.	2,453	1,239	112	84	bbis. 1,001
Starch.....Lbs.			1,200	64	
Sugar—refined.....Lbs.	3,400	507			
Confectionery.....Lbs.					
Tallow.....					
<i>Tobacco and Manufactures of :</i>					
Leaf.....Hhds.	25,999	4,094,008	lbs. 16,302,780	2,421,175	lbs. 11,311,564
Manufactured.....Lbs.	57,127	15,205	53,203	31,250	
Vinegar.....Gals.					
Wax.....Lbs.	13,035	3,907	1,280	470	
Wearing apparel.....		100			
<i>Wood and Manufactures of :</i>					
Boards, &c.....M ft.	72	1,203	114	2,835	200
Shingles.....M.	7,747	39,738	1,067	6,932	1,839
Box shooks.....					
Other shooks, staves and headings.....M.	6,457	220,719	4,562	242,943	
Hoop and other poles.....M.			10	450	
Fire-wood.....Cords					10
Logs, masts, &c.....					
Lumber, sawed and hewn.....Tons	260	3,755			418
All other timber.....		3,561			
Household furniture.....		2,860			
Manufactures of wood, not specified.....		41,524		428	
<i>All articles, not enumerated :</i>					
Unmanufactured.....		1,232		12,510	
Manufactured.....		2,939		254	
Total.....		\$7,262,765		\$4,244,551	

CONTINUED.

1869.	1870.		1871.		1872.		1873.		1874.	
Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
							12	16		
3,788										
								80		
				1,875						
					552	33				
	gals.									
660	80	45								
						9				
	700	90			80	11	21,401	1,544		
	lbs.		lbs.		lbs.		lbs.		lbs.	
1,552,961	6,246,119	862,855	6,124,079	752,542	11,646,717	1,327,160	7,493,036	900,501	18,365,515	1,928,659
45,073		18,070			635	17,315		223,273		13,380
	200	80								
								100		200
10,183	43	1,475	10	260	126	3,013			31	474
12,722	989	6,589	795	6,490	2,219	16,189	1,445	10,935	912	6,587
133										
353,721		184,274		240,306		416,824		413,710		310,242
					800	11				
60			2	8						
	cubic ft.				cubic ft.		cubic ft.		cubic ft.	
23,590	26,844	6,500			160	120	22,635	9,527	7,046	4,069
		7,125				2,610		11,317		2,794
								3,059		
50		576				1,455		595		
		4,875				150				153
17,369										
1,536		8,638		2,100						
\$3,327,450		\$2,983,258		\$2,046,3		\$3,518,387		\$3,458,466		\$5,299,670

No. 7.

Statement of the DIRECT TRADE (Imports and Domestic Exports) of VIRGINIA PORTS during the fiscal years named.

YEARS.	CUSTOMS DISTRICTS.	IMPORTS.	DOMESTIC EXPORTS.	IMPORTS.		EXPORTS.	
				In American Vessels.	In Foreign Vessels.	In American Vessels.	In Foreign Vessels.
1853	Richmond	\$ 665,996	\$6,346,399	.....	.....	.....	.....
	Norfolk and Portsmouth.....	174,997	561,185	.....	.....	.....	.....
	Alexandria.....	113,265	325,057	.....	.....	.....	.....
	Petersburg.....	122,165	5,992	.....	.....	.....	.....
	Tappahannock.....	2,723	24,132	.....	.....	.....	.....
	Total.....	\$1,079,056	\$7,262,765	\$785,217	\$293,839	\$5,890,324	\$1,372,441
1868	Richmond	\$ 29,260	\$2,525,457	.....	.....	.....	.....
	Norfolk and Portsmouth.....	15,740	1,719,094	.....	.....	.....	.....
	Alexandria.....	6,636	.....	.....	.....	.....	.....
	Petersburg.....	4,943	.....	.....	.....	.....	.....
	Total.....	\$56,579	\$4,244,551	.....	.....	.....	.....
1869	Richmond.....	\$ 41,214	\$1,886,428	.....	.....	.....	.....
	Norfolk and Portsmouth.....	205,591	1,371,796	.....	.....	.....	.....
	Alexandria.....	5,632	34,334	.....	.....	.....	.....
	Petersburg.....	4,402	34,892	.....	.....	.....	.....
	Total.....	\$259,739	\$3,327,450	.....	.....	.....	.....
1870	Richmond	\$ 91,777	\$1,636,770	\$23,924	\$67,853	\$355,069	\$1,281,701
	Norfolk and Portsmouth.....	14,451	1,307,440	66	14,385	150,633	1,156,807
	Alexandria	33,822	39,048	2,953	30,869	8,440	30,608
	Petersburg	1,263	.....	.....	1,263	.....	.....
	Total.....	\$141,313	\$2,983,258	\$26,943	\$114,370	\$514,142	\$2,469,116
1871	Richmond	\$ 68,563	\$1,418,262	\$11,419	\$ 57,144	\$656,744	\$ 761,518
	Norfolk and Portsmouth.....	94,091	628,048	28,618	65,473	158,079	469,969
	Alexandria	14,908	.....	12,410	2,498	.....	.....
	Total.....	\$177,562	\$2,046,310	\$52,447	\$125,115	\$814,823	\$1,231,487
1872	Richmond	\$ 227,263	\$2,574,060	\$ 1,406	\$225,857	\$1,593,530	\$ 980,530
	Norfolk and Portsmouth.....	290,128	888,087	98,523	191,605	379,667	508,370
	Alexandria	15,310	56,290	3,015	12,295	2,317	53,973
	Petersburg.....	95,247	.....	.....	95,247	.....	95,247
	Total.....	\$627,948	\$3,518,387	\$102,944	\$525,004	\$1,975,514	\$1,633,120

No. 7—CONTINUED

YEARS.	CUSTOMS DISTRICTS.	IMPORTS.	DOMESTIC EXPORTS.	IMPORTS.		EXPORTS.	
				In American Vessels.	In Foreign Vessels.	In American Vessels.	In Foreign Vessels.
1873	Richmond	\$286,599	\$2,179,523	\$ 727	\$255,572	\$1,102,329	\$1,077,194
	Norfolk and Portsmouth.....	146,367	1,235,068	2,400	143,967	297,136	937,932
	Alexandria	13,424	26,125	5,264	8,160	26,125	.....
	Petersburg.....	476,661	17,750	41,553	435,103	.....	17,750
	Total.....	\$923,051	\$3,458,466	\$49,949	\$873,102	\$1,425,590	\$2,032,876
1874	Richmond	\$154,260	\$3,463,626	\$ 3,421	\$152,839	\$1,703,965	\$1,759,061
	Norfolk and Portsmouth.....	80,351	1,831,036	1,432	78,949	555,512	1,275,224
	Alexandria	27,606	5,908	14,656	12,920	5,908	.....
	Petersburg.....	72,319	.....	45,249	27,070	.....	.....
	Total.....	\$336,536	\$5,299,670	\$64,788	\$271,778	\$2,264,785	\$3,034,585

The *direct* IMPORTATIONS of Virginia do not embrace a great variety of articles when compared with those of the chief importing centres of the country, but an inspection of the following tables of the different *articles*, and their *quantity* and *value*, that have been imported since 1868, will show a marked increase both in kinds and quantities, allowing for the exceptional state of trade since 1873. The importations of each of the four Virginia cities engaged in the foreign trade are presented separately. Each one should do much more of this business.

The Direct* Trade of Richmond for the calendar year 1875 was as follows :

IMPORTS.		EXPORTS.	
Coffee from Brazil.....	\$520,407	Flour.....	\$1,073,469
Cave earth from West Indies.....	7,035	Lard	10,762
Gypsum from Nova Scotia.....	3,349	Cotton goods.....	2,369
Salt from England.....	34,733	Rosin.....	1,740
Bags and bass mats from England.....	372	Box cars and car trucks.....	3,129
Bottled beer from England.....	2,103	Dressed hoops.....	16,652
Medical stores from England.....	759	Staves.....	17,609
Other articles.....	219	Lumber and timber.....	34,698
Total direct.....	\$568,962	Locust tree nails.....	1,012
Brought "in bond" from other districts.....	17,440	Bituminous coal.....	4,493
Total imports.....	\$586,402	Iron tanks, boilers, &c.....	4,270
		Tobacco (leaf).....	1,007,539
		Tobacco (strips).....	76,427
		Quercitron	400
		Baskets, banisters and hogsheds.....	273
		Miscellaneous.....	284
		Total exports.....	\$2,243,716

* From Richmond Dispatch January 1st, 1876.

IMPORTS of RICHMOND direct from Foreign Countries during the fiscal years named.

ARTICLES.	1868.		1869.		1870.		1871.		1872.		1873.		1874.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Coffee.....Lbs.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	323,450	\$44,030	414,403	\$85,602
Salt.....Lbs.	6,653,043	\$26,574	5,955,873	\$25,507	10,829,980	\$39,937	10,433,008	\$36,766	13,026,949	\$46,077	14,817,209	69,397	12,786,302	62,156
Sugar—brown.....Lbs.	.....	.....	460	33	393	36	.....	.....	.....	.....	.....	.....	.....	.....
Molasses.....Gals.	.....	.....	33,974	6,047	33	12	.....	.....	.....	.....	.....	.....	.....	.....
Crackers, &c.....Lbs.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Potatoes.....Bus.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6,274	1,013	.....	.....
Fruits and nuts.....	.....	.....	.....	.....	.....	.....	173	.....	.....	.....	.....	.....	20	9
Spices.....Lbs.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Oil—saled.....Gals.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5,700	1,961
Oil—fish.....Gals.	.....	.....	101	153	128	195	.....	.....	.....	.....	.....	.....	76	143
Fish—cured.....	.....	.....	.....	800	.....	.....	.....	.....	.....	25	.....	.....	.....	.....
Soda—bicarbonate.....Lbs.	23,225	894	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gum Arabic.....	5,042	584	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Spirits in casks.....Gals.	352	529	.....	.....	229	323	.....	.....	.....	.....	3,048	2,643	193	190
Spirits in bottles.....Doz.	.....	.....	108	697	.....	.....	.....	.....	204	302	.....	.....	.....	.....
Wine in casks.....Gals.	.....	.....	62	98	31	44	.....	.....	.....	.....	1,344	1,272	.....	.....
Wine in bottles.....Doz.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8	44	.....	.....
Cigars.....Lbs.	.....	.....	.....	.....	44	85	.....	.....	.....	.....	.....	.....	.....	.....
Malt liquors, beer, &c.....Gals.	.....	.....	.....	.....	.....	.....	.....	.....	3,969	3,466	900	1,004	2,744	3,673
Paintings.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	14
Coal—bituminous.....Tons.	.....	.....	.....	.....	.....	.....	32	74	17	40	.....	.....	.....	.....
Earthen and stoneware, china, &c.....	.....	.....	.....	.....	.....	.....	.....	3,812	.....	9,780	.....	1,638	.....	10
Gypsum.....Tons.	715	749	3,013	3,408	5,338	4,905	4,325	3,667	1,600	1,881	765	727	3,835	3,927

IMPORTS OF NORFOLK AND PORTSMOUTH direct from Foreign Countries during the Fiscal Years named.

ARTICLES.	1868.		1869.		1870.		1871.		1872.		1873.		1874.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Animals—living.....												\$ 11		
Coffee.....Lbs.	1,486	\$ 281												
Salt.....Lbs.	3,046,648	7,437			4,145,211	\$ 11,002	3,067,287	7,227	3,321,936	\$10,834	6,247,445	20,404	3,276,249	\$9,380
Sugar.....Lbs.	2,767	76												
Molasses.....Gals.	5,308	1,174	18,065	6,485										
Tea.....Lbs.									138	75	368	247	369	176
Biscuits, crackers, &c.....Lbs.									312	54				
Provisions—meats.....										91				
Seeds, not specified.....										1,209		2,141		585
Wheat.....Bus.											7	15	15	26
Oats.....Bus.											20	10		
Rye.....Bus.											3	5		
Potatoes.....Bus.											5	4		
Peas.....Bus.											3	4		
Meal.....												10		8
Mustard.....Lbs.	36	8												
Mackerel—pickled.....Bbls.									1	10	1	2	100	645
Fish.....				1,495								12		
Herring.....Bbls.											773	914		
Spirits in casks.....Gals.	625	1,255			78	125			1,060	1,729	792	1,469	400	624
Spirits in bottles.....Doz.									5	34	1	10	13	76
Wine in casks.....Gals.						530	1,513						215	393
Wine in bottles.....Doz.									2	2	31	246	5	16

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[illegible]

Cabinetware.....									1		475	40
Wood—manufactures of.....												
Lumber, unmanufactured wood, &c.....									25,000			
Personal property.....									19,860		39,309	16,511
All other articles.....									231		1,037	78
Total.....	\$15,740								\$290,128		\$146,367	\$50,881
Brought in American vessels.....												\$ 1,431
Brought in foreign vessels.....												\$78,949
Imports free of duty.....	\$ 441								\$ 45,766		\$ 40,153	\$18,450
Imports paying duty.....	\$15,299								\$244,362		\$106,214	\$61,931

In 1873 Norfolk and Portsmouth imported 1-129th, and in 1874 1-232nd of the salt brought to the Union.

Norfolk and Portsmouth have unrivaled advantages for doing a large portion of the immense *grocery trade* of the country, so favorably are they situated in reference to the ocean highways that lead to and from the lands where sugar, molasses, spices, coffee, tropical fruits, &c., &c., are the staple products, and so much nearer are they to the centre of population, and therefore of consumption, in the United States than any other seaport that can lay claim to being in the "offing" for this trade. The table suggests more than it presents, and the same is true of those for the other cities.

IMPORTS OF PETERSBURG direct from Foreign Countries during the fiscal years named.

ARTICLES.	1868.		1869.		1870.		1871.		1872.		1873.		1874.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Iron—railroad.....														
Iron—hoop.....	9,907	63												
Iron—manufactures of.....														
Steel—railroad bars, &c.....														
Iron and steel manufactures—not specified.....														
Cabinetware.....														
Personal property.....														
Guanos.....														
Cordage, rope, &c.....														
Beer.....														
Brass—manufactures of.....														
Glass—cylinder.....														
Castings—iron, &c.....														
Machinery.....														
Salt.....	792,300	3,349												
Tea.....														
Spirits in casks.....														
Wine in casks.....														
Wine in bottles.....														
Rags for paper.....														
Cotton—manufactures of.....														
Total value.....														
Brought in American vessels.....														
Brought in Foreign vessels.....														
Imports free of duty.....														
Imports paying duty.....														

Petersburg, with its deeper port of City Point, has facilities for foreign commerce that should give her a larger and steadier import trade than is indicated above, and a large and productive area of country is naturally tributary to her wharves for sendings to and receiving from abroad. The table leaves the impression that her trade has been spasmodic.

IMPORTS of ALEXANDRIA direct from Foreign Countries during the fiscal years named.

ARTICLES.	1868.		1869.		1870.		1871.		1872.		1873.		1874.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Gypsum.....Tons.	1,195	\$1,142	2,940	\$2,647	3,190	\$ 2,953	6,300	\$5,669	3,350	\$ 3,015	5,854	\$ 5,264	15,455	\$13,910
Salt.....Dns.	2,422,498	5,476	2,424,691	5,495	4,955,577	30,102	1,658,339	* 8,997	6,906,527	10,532	2,962,841	7,517	3,770,388	12,918
Hemp—manufactures of.	390	.....	.....	.....	242	.....	1,763	.....	643	.....	.....
Potatoes.....Bus.	1,946	778
Coal—bituminous.....Tons.	10	48	.....	.....	.....	.....	.....	.....	.....	.....
Fruits and nuts.....	719	.....	.....	.....	.....	.....	.....	.....	.....
Total value of imports..	\$6,636	.....	\$5,532	.....	\$33,822	.....	\$14,908	.....	\$15,310	.....	\$13,424	.....	\$27,606
Brought in American vessels.....	\$2,647	.....	\$ 2,953	.....	.....	.....	.....	.....	.....	.....	\$14,686
Brought in Foreign vessels.....	\$5,885	.....	\$30,869	.....	.....	.....	.....	.....	.....	.....	\$12,920
Imports free of duty.....	\$1,142	.....	\$2,647	.....	\$30,869	.....	.....	.....	\$ 3,015	.....	\$5,264	.....	\$13,910
Imports paying duty.....	\$5,494	.....	\$5,885	.....	\$2,953	.....	.....	.....	\$12,295	.....	\$5,160	.....	\$13,696

In 1873 Alexandria imported 1-253th of the salt of the Union, and there was brought into Virginia 1-3rd of the whole importation. In 1874 Alexandria imported 1-8th of the gypsum and 1-232nd of the salt.

Alexandria confines her importations, it would seem, to the gypsum of Nova Scotia and the salt of England. Her advantages for commerce are excellent, and the completion of works of internal improvement that are in progress will doubtless restore to her the foreign trade she formerly enjoyed.

There can be no question but that many of the imports that are consumed in the West, Southwest and South could reach consumers more cheaply, expeditiously and in better condition by way of the Virginia ports than by any other, and present indications lead to the conclusion that the import tables of the future will be filled with fewer empty spaces and more figures above the thousands than those above presented.

The COASTWISE TRADE of Virginia is very large in proportion to the number of her commercial population.

The following tables present all the facts contained in the United States Reports on Commerce and Navigation. Only the three years given have any coastwise trade report:

No. 1.

ENTRANCES into Virginia Customs Districts, in the Coastwise Trade, during the fiscal year 1871.

CUSTOMS DISTRICTS.	STEAMERS.			SAILING VESSELS.			TOTAL ENTRANCES.		
	No.	Tons.	Crews.	No.	Tons.	Crews.	No.	Tons.	Crews.
Richmond.....	519	332,837	13,231	114	21,956	798	633	404,793	14,029
Petersburg.....	429	349,059	10,255	36	5,387	202	465	354,446	10,457
Norfolk and Portsmouth.....	1,213	1,080,292	32,109	133	15,130	730	1,346	1,095,422	32,839
Alexandria.....	138	66,233	2,153	64	8,501	304	202	74,734	2,457
Cherrystone.....				5	198	21	5	198	21
Tappahannock.....	88	66,286	1,185	1	45	3	89	66,331	1,188
Yorktown.....	263	240,234	7,923	19	1,356	75	282	241,590	7,103
Aggregate.....	2,650	2,184,941	65,961	372	52,573	2,133	3,022	2,237,514	68,094

The seven Virginia customs districts entered about 1-25th of the vessels and 1-15th of the tonnage of all from the 98 districts then in the United States. The number of *entrances* was nearly the same as those of New York city, and the tonnage was 452,655 tons *more*—facts that prove the great value of the home trade of the State.

No. 2.

CLEARANCES from Virginia Customs Districts, in the Coastwise Trade, during the fiscal year 1871.

CUSTOMS DISTRICTS.	STEAMERS.			SAILING VESSELS.			TOTAL CLEARANCES.		
	No.	Tons.	Crews.	No.	Tons.	Crews.	No.	Tons.	Crews.
Richmond.....	518	330,670	13,183	14	1,866	61	532	332,536	13,244
Petersburg.....	421	346,614	10,167	8	494	30	429	347,108	10,197
Norfolk and Portsmouth.....	765	691,748	21,076	55	5,083	245	820	696,836	21,321
Alexandria.....	138	67,115	2,179	44	7,763	225	182	74,878	2,404
Tappahannock.....	83	63,654	1,129	1	45	3	84	63,699	1,132
Yorktown.....	265	242,012	7,080	4	211	16	269	242,223	7,096
Aggregate.....	2,190	1,791,813	54,814	126	15,467	580	2,316	1,807,280	55,394

The *clearances* from Virginia ports embraced about 1-39th of the vessels, 1-16th of the tonnage and 1-17th of the crews of all the coastwise trade of the United States for the year. The tonnage cleared was greater than that of any district in the United States, excepting New York, Chicago and Milwaukee.

No. 3.

ENTRANCES into Virginia Customs Districts, in the Coastwise Trade, during the fiscal year 1872.

CUSTOMS DISTRICTS.	STEAMERS.			SAILING VESSELS.			TOTAL ENTRANCES.		
	No.	Tons.	Crews.	No.	Tons.	Crews.	No.	Tons.	Crews.
Cherrystone.....	1	872	25	8	192	21	9	1,064	46
Richmond.....	603	463,916	14,354	156	26,903	855	759	490,819	15,239
Petersburg	481	420,622	11,672	28	3,202	131	509	423,824	11,803
Norfolk and Portsmouth.....	1,258	1,137,280	31,451	186	22,052	933	1,444	1,159,332	32,384
Alexandria.....	162	82,894	2,476	34	8,663	231	196	91,557	2,707
Tappahannock	82	60,959	1,927	2	95	7	84	61,054	1,934
Yorktown	135	125,459	3,617	7	776	34	142	126,235	3,651
Aggregate.....	2,722	2,292,002	65,522	421	61,883	2,242	3,143	2,353,885	67,764

The *entrances* of 1872 were about 1-23rd of the vessels and 1-14th of the tonnage of the whole coastwise and fishing trade of the Union. The tonnage that entered Virginia was greater than that of any district of the country with the single exception of Milwaukee, Wisconsin. There were 153 more vessels entered than to New York city in this trade. The increase over the previous year is quite respectable.

No. 4.

CLEARANCES from Virginia Customs Districts, in the Coastwise Trade, during the fiscal year 1872.

CUSTOMS DISTRICTS.	STEAMERS.			SAILING VESSELS.			TOTAL CLEARANCES.		
	No.	Tons.	Crews.	No.	Tons.	Crews.	No.	Tons.	Crews.
Cherrystone.....									
Richmond.....	603	463,709	14,345	34	4,796	170	637	468,505	14,515
Petersburg	466	409,505	11,358	11	2,017	74	477	411,522	11,432
Norfolk and Portsmouth.....	984	909,845	26,042	90	11,596	445	1,074	921,441	26,487
Alexandria	161	82,177	2,455	32	7,832	209	193	90,009	2,664
Tappahannock	80	59,382	1,880	1	45	3	81	59,427	1,883
Yorktown.....	135	125,459	3,617	.....	.....	.....	135	125,459	3,617
Aggregate.....	2,429	2,050,077	59,697	168	26,286	901	2,597	2,076,363	60,598

The *clearances* of 1872 were 1-23d, with 1-14th of the tonnage of all that occurred in the Union for the year. The increase over 1871 was more than 12 per cent. in the number of vessels and nearly 15 per cent. in tonnage. The increase of tonnage from Richmond, Petersburg, Norfolk and Alexandria is noteworthy.

No. 5.

ENTRANCES into Virginia Customs Districts, in the Coastwise Trade, during the fiscal year 1873.

CUSTOMS DISTRICTS.	STEAMERS.			SAILING VESSELS.			TOTAL ENTRANCES.		
	No.	Tons.	Crews.	No.	Tons.	Crews.	No.	Tons.	Crews.
Cherrystone.....				3	111	10	3	111	10
Richmond.....	526	463,869	12,577	182	30,092	1,025	708	493,961	13,602
Petersburg.....	364	389,347	9,647	3	219	12	367	389,566	9,659
Norfolk and Portsmouth.....	1,170	1,188,069	31,501	117	17,338	653	1,287	1,155,407	32,154
Alexandria	189	97,208	2,766	24	6,917	176	213	104,125	2,942
Tappahannock.....	88	66,620	2,015	.....	.....	.....	88	66,620	2,015
Yorktown.....	180	134,792	3,505	2	122	8	182	134,914	3,513
Aggregate.....	2,467	2,289,905	62,011	331	54,799	1,884	2,798	2,344,704	63,895

Eighteen hundred and seventy-three gave, in the entrances to Virginia ports, about 1-27th of the vessels and 1-15th of the tonnage of the coasting trade of the Federal Union. The tonnage entrances of Chicago and Milwaukee alone were greater. The diminished aggregates show the effects of the great panic of 1873, that prostrated the trade of the whole country. The tonnage that entered Norfolk was greater than that which entered Baltimore or Boston.

No. 6.

CLEARANCES from Virginia Customs Districts, in the Coastwise Trade, during the fiscal year 1873.

CUSTOMS DISTRICTS.	STEAMERS.			SAILING VESSELS.			TOTAL CLEARANCES.		
	No.	Tons.	Crews.	No.	Tons.	Crews.	No.	Tons.	Crews.
Cherrystone.....									
Richmond.....	509	450,997	11,743	34	5,762	211	543	456,759	11,954
Petersburg.....	335	363,323	9,013	5	1,083	26	340	364,406	9,039
Norfolk and Portsmouth.....	866	918,948	25,057	48	4,724	209	914	923,672	25,266
Alexandria	190	97,208	2,766	23	6,375	161	213	103,583	2,927
Tappahannock.....	88	67,468	2,010	.....	.....	.....	88	67,468	2,010
Yorktown.....	129	133,731	3,477	2	122	8	131	133,853	3,485
Aggregate.....	2,117	2,031,675	54,063	112	18,066	615	2,229	2,049,741	54,681

The customs districts of Virginia in 1873 cleared about 1-38th of the vessels and 1-14th of the tonnage that was engaged in the coastwise and fishing trade of the United States. The clearances, of course, were diminished by the stoppage or trade consequent to the panic.

IMMIGRATION to Virginia, *direct* from foreign countries, began in 1871, through the port of Norfolk, which has monopolized this business.

The following tables, compiled from the United States official returns, embrace all the information that is collected.

Not a single death on-ship-board is reported among the immigrants to Virginia during the years for which statistics are given.

The harbors of Virginia possess unsurpassed advantages as landing places for immigrants seeking homes in almost any portion of the United States. (See maps Nos. 3 and 4.)

No. 1.

YEARS.	ARRIVALS.								DEPARTURES.			
	SEX.	Whole number.	IMMIGRANTS.			Foreigners—not immigrants.	OCCUPIED.		Whole number.	Adults.	Children.	In sailing vessel—steerage.
			Under 15.	Ages.			Cabin.	Other parts of ship.				
				15 and under 40	40 and upwards							
1871.....	Males.....	51	10	33	6	2	9	42	96	34	62	96
	Females....	23	6	12	4	6	8	20	96	37	59	96
	Total..	79	16	45	10	8	17	62	192	71	121	192
1872.....	Males.....	438	68	337	33	.....	26	412	128	60	68	128
	Females....	226	84	122	20	.....	22	204	115	57	58	115
	Total..	664	152	459	53	.....	48	616	243	117	126	243
1873.....	Males.....	730	190	454	86	.....	.....	.....	.....	.....	.....	.....
	Females....	460	179	232	49	.....	.....	.....	.....	.....	.....	.....
	Total..	1,190	369	686	135	.....	153	1,037	.....	.....	.....	.....
1874.....	Males.....	296	83	191	21	*1	.....	.....	.....	.....	.....	.....
	Females....	212	72	126	14	.....	.....	.....	.....	.....	.....	.....
	Total..	508	155	317	35	1	129	379	.....	.....	.....	.....

The immigration in 1871 was 1-2,080th, in 1872 1-309th, in 1873 1-39th, and 1874 1-226th of the whole of the intending settlers that came to the United States. These comparative figures show that a fair and growing business has been done in turning a portion of the tide of immigration into Virginia ports. There is no reason why steady progress should not be made and the State be thereby materially enriched.

* Citizen of the United States.

No. 2.

Table of the NUMBER and NATIONALITY of IMMIGRANTS that Arrived in Virginia during the years named.

FROM	1871.	1872.	1873.	1874.
England.....	71	643	1,075	431
Ireland			13	8
Scotland.....		5	8	6
Germany.		4	84	15
France.....		8	4	18
Denmark.....			6	
Sweden.....				29
Belgravia		1		
Nova Scotia.....		3		
Total immigrants.....	71	664	1,190	507

It appears that England has furnished the largest number of immigrants, Germany the next, and Sweden comes third, corresponding thus in the element of nationality with the influx into the United States. Fully 9,000,000 immigrants have come into the Union since 1790, and over half of these have been of British and one-third of German origin; lately many Swedes and other Scandinavians have arrived. The United States Commissioner* of Immigration says of these people the British "speak our language and a large part are acquainted with our laws and institutions, and are soon assimilated with and absorbed into our body-politic;" the Germans, "being at once an industrious and an intelligent people, a large proportion settling in rural districts and developing the agricultural resources of the West and South, while the remainder, consisting largely of artisans and skilled workmen, find profitable employment in the cities and manufacturing towns;" the Scandinavians are "industrious, economical and temperate—their advent should be especially welcomed."

Fr. Kapp, one of the New York Commissioners of Emigration, in a work published in 1870, after a careful investigation, estimates the value of each male emigrant at \$1,500, and of each female \$750, making an average of \$1,125, considered merely as laborers, as it will cost the country that much to rear them.

Special Report on Immigration by Edward Young, Chief of Bureau of Statistics, Washington, D. C.—to be had on application.

No. 3.

Table of OCCUPATIONS of IMMIGRANTS that Arrived in Virginia from 1871 to 1874.

OCCUPATION.	1871.	1872.	1873.	1874.
Architects		1		
Blacksmiths.....			6	3
Butchers		1		1
Clergymen.....		2	9	
Clerks.....	3	6	8	7
Carpenters		40	20	1
Engineers		1		
Engine-makers			8	
Farmers	32	155	142	113
Grocers.....				5
Iron workers.....			9	
Joiners.....		24		
Laborers.....	4	39	92	17
Mariners.....		1		
Masons.....		3	18	1
Mechanics, not specified.....		36		3
Miners.....		6	3	
Merchants.....		18	63	
Machinists			4	4
Spinners.....		5		
Shoemakers			15	1
Shipwrights			2	
Seamstresses			2	
Tailors.....		14	10	
Tinners.....			1	
Wheelwrights			1	
Occupation not stated.....	28			
Without occupation*.....	4	312	777	351
Total.....	71	* 664	1,190	507

The large percentage of "skilled labor" represented among these tabulated occupations is worthy of note. It is difficult to estimate the value of such labor, coming as it does from old countries where *skill* has been accumulating for centuries, when introduced into a comparatively new and sparsely peopled country.

*Those classed as having "no occupation" are mostly women and children.

The NAVIGATION STATISTICS that follow are compiled from the annual reports of the Register of the Treasury of the United States. They show the exact condition of the shipping of the State in each of a series of years, and present, in a concise form, the history of the changes that have taken place.

No. 1.

GENERAL STATEMENT showing the NUMBER and TONNAGE of REGISTERED, ENROLLED and LICENSED VESSELS in Virginia at the close (June 30th) of each of the fiscal years named.

YEARS.	REGISTERED.						ENROLLED.						LICENSED UNDER 20 TONS.				AGGREGATE.	
	PERMANENT.		TEMPORARY.		TOTAL.		PERMANENT.		TEMPORARY.		TOTAL.		20 TONS.		AGGREGATE.			
	No.	Tons..	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.		
1868*	.....	†4,786.14	.....	24,772.49	.....	29,557.63	.....	45,862.68	.....	.....	.....	45,862.68	.....	.....	3,315.81	.....	68,336.57
1868.	1	186.40	75	14,365.15	76	14,551.51	340	14,890.24	12	1,439.27	352	16,329.51	492	4,091.25	910	35,572.31		
1869.	1	186.40	55	6,921.77	56	7,008.17	330	15,223.04	13	1,936.84	343	17,159.88	512	5,265.69	911	29,433.74		
1870.	1	186.40	28	7,427.84	29	7,614.24	305	14,700.51	12	1,960.54	317	16,661.05	511	4,994.36	887	29,271.65		
1871.	1	186.40	16	1,341.23	17	1,527.63	472	22,951.48	11	2,314.20	483	25,265.08	525	6,304.47	1,025	32,097.78		
1872.	1	212.67	23	3,648.74	24	3,861.41	537	26,942.13	1	349.66	537	26,942.13	595	5,925.02	1,157	37,073.22		
1873.	.....	.....	20	3,850.97	20	3,850.97	463	22,613.01	11	1,595.60	474	24,208.61	615	5,596.31	1,109	33,965.59	
1874.	.....	.....	15	2,910.76	15	2,910.76	360	16,719.53	10	2,464.27	370	19,183.80	632	6,319.35	1,017	28,413.91	

* The number of vessels is not given in the report for 1868.

† The fractions of a ton in 1853 were reported 96lbs.

In 1874 Virginia had about 1-32nd of the vessels of the United States, under the above classification, and 1-171th of the tonnage. Many of the vessels belonging to the State are engaged in the oyster trade, which does not require vessels of a large size, and besides the extensive tidal waters of this State are so protected that smaller vessels can be more advantageously employed than where rougher waters are to be encountered.

No. 2.

Statement showing the Number and Tonnage of Enrolled and Licensed Iron Vessels in Virginia at the close of the fiscal years named.

YEARS.	ENROLLED.		LICENSED UNDER 20 TONS.		TOTAL.	
	Permanent.					
	No.	Tons.	No.	Tons.	No.	Tons.
1873	7	728.03	1	16.48	8	744.51
1874	9	884.19	1	16.48	10	900.67

The above are all *included* in the General Statement of Registered, Enrolled, &c., Vessels—Table No. 1.

There are no returns of iron vessels in Virginia previous to 1873. Only 205 iron vessels belonged to the entire United States in 1874, and Virginia about 1-20th of all.

No. 3.

Statement of the STEAM TONNAGE of Virginia at the close (June 30th) of each of the fiscal years named.

YEARS.	REGISTERED.		ENROLLED.		LICENSED UNDER 20 TONS.		TOTAL.	
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
1858*.....				4,691.63				4,691.63
1868.....	5	1,076.87	45	4,215.73	7	116.47	53	5,409.07
1869.....	4	1,279.27	46	4,474.75	10	157.16	60	5,911.18
1870.....	5	1,255.58	50	4,645.54	9	143.00	64	6,044.12
1871.....	2	299.42	50	4,814.84	9	139.16	61	5,253.42
1872.....	3	528.95	55	5,363.66	10	153.13	68	6,045.74
1873.....	4	306.35	54	5,092.28	15	222.44	73	5,621.07
1874.....	2	219.93	59	5,204.83	13	180.29	74	5,605.05

The above are all *included* in the General Statement of Registered, &c., Vessels.

*Only tonnage is given in the report for 1858, and the fractions of tons for that year are 95ths.

No. 4.

General Statement showing the Number and Tonnage of Sailing and Steam Vessels, Barges and Canal Boats in Virginia Customs Districts at the close of the years named.

YEARS.	SAILING VESSELS.		STEAM VESSELS.		CANAL BOATS.		BARGES.		TOTAL.	
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
1868.....	814	26,840.41	58	5,409.07	23	2,051.36	15	1,271.47	910	35,572.31
1869.....	798	18,467.18	60	5,911.18	23	1,727.73	30	3,327.65	911	29,433.74
1870.....	756	20,343.84	64	6,044.12	26	1,934.55	11	949.14	857	29,271.65
1871.....	830	18,428.67	61	5,253.42	119	7,156.88	15	1,258.81	1,025	32,097.78
1872.....	927	20,702.10	68	6,045.74	143	8,795.31	19	1,535.07	1,157	37,078.22
1873.....	923	20,875.36	73	5,621.07	92	5,910.95	21	1,548.51	1,109	33,955.89
1874.....	917	20,796.46	74	5,605.05	4	140.43	22	1,871.97	1,017	28,413.91

No. 5.

Statement showing the Class, Number and Tonnage of Iron Vessels in Virginia at the close of the fiscal years named.

YEARS.	STEAM VESSELS.		BARGES.		TOTAL.	
	No.	Tons.	No.	Tons.	No.	Tons.
1873	8	744.51	.....	.....	8	744.51
1874	8	744.51	2	156.16	10	900.67

The above are all *included* in the General Statement—Table 1—of Number, &c., of Sailing Vessels, &c., in Virginia.

The MERCHANT MARINE of Virginia—that is, the number and amount of tonnage of merchant vessels *belonging to* the several customs districts and ports of the State—has been increasing in a satisfactory manner, as appears from the following table showing its condition at the close of each of the fiscal years named:

No. 6.

YEARS.	SAILING VESSELS.		STEAM VESSELS.		UNRIGG'D VESSELS		TOTAL.	
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
1870*.....	791	14,778.07	57	4,055.23	29	2,213.56	877	21,046.86
1871.....	832	16,343.86	61	5,094.05	135	8,378.95	1,028	29,816.86
1872.....	900	17,538.57	67	5,811.71	159	9,950.62	1,126	33,300.90
1873.....	926	17,311.54	67	4,966.53	123	8,987.93	1,116	31,266.05
1874.....	791	15,487.41	73	5,209.01	28	1,927.12	892	22,623.54

* The reports in this form began to be made in 1870.

The depression in trade incident to the panic of 1873 accounts for the decrease of tonnage in 1873 and 1874, in which Virginia suffered in common with the other States. Only six of the twenty Atlantic and Gulf-coast States had any increase in tonnage, and the leading commercial State, New York, had a larger proportional decrease than Virginia.

The following table shows how the Merchant Marine of Virginia was distributed among the Customs Districts of the State June 30th, 1874:

No. 7.

CUSTOMS DISTRICTS.	SAILING VESSELS		STEAM VESSELS.		UNRIGG'D VESSELS		TOTAL.	
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
Alexandria	81	2,096.70	14	497.50	.....	.....	95	2,594.20
Cherrystone.....	211	4,410.26	1	21.45	.....	.....	212	4,431.71
Norfolk and Portsmouth*.....	304	4,556.11	48	4,371.47	15	1,012.32	367	9,339.90
Petersburg.....	4	37.00	3	34.00	.....	.....	7	71.00
Richmond.....	6	248.20	6	263.11	13	914.80	25	1,431.11
Tappahannock.....	84	2,077.38	.....	.....	.....	.....	84	2,077.38
Yorktown	101	2,061.76	1	16.48	.....	.....	102	2,078.24
Aggregate.....	791	15,487.41	73	5,209.01	28	1,927.12	892	22,623.54

Virginia had in 1874 about 1-24th of the merchant vessels held on the Atlantic and Gulf coasts, and 1-32nd of all belonging to the Union; her tonnage was about 1-148th of that of the Atlantic and Gulf coasts, and 1-213th of all held in the United States; her rank was 7th in number of vessels and 11th in tonnage, outranking the other Southern States, excepting Maryland, in the number of vessels, and that State and Louisiana in tonnage. The merchant marine of Norfolk and Portsmouth alone surpassed that of either of the States of North Carolina, South Carolina, Georgia, Florida, Alabama or Mississippi; in fact few places in the country have a larger number of sailing vessels than either Norfolk or Cherrystone.

SHIP BUILDING ought to be a leading industry in this State, because of the abundance of all the materials required both for iron and wooden vessels, and of the best quality, at hand, and therefore cheap, while her climate is favorable for *active work the year round*. The following statement shows a steady progress in this important industry, allowing for the anomalous condition of affairs in part of 1873 and in 1874.

*The Norfolk Landmark of January 16th, 1876, reports that at the commencement of 1876 that that port had 384 vessels, with a tonnage of 15,803.51, registered, enrolled and licensed, and had licensed in the coasting trade 114 vessels, with a tonnage of 8,285.77. The entrances from foreign ports in 1875 were 25 vessels, with a tonnage of 14,968, and the clearances to foreign ports were 121 vessels, with a tonnage of 53,683—showing a decided increase over the returns of 1874.

No. 8.

Statement of the Number and Tonnage of VESSELS of all kinds BUILT in Virginia during the fiscal years named.

YEARS,	STEAM VESSELS,				RIVER STEAMERS,				SAILING VESSELS,						BARGES,		CANAL BOATS,		AGGREGATE.							
	Side-wheel.		Stern-wheel.		Propellers,		Total.		Schooners,		Sloops,		Total.													
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.								
																			No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
																			No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
1868								1		10		2		14				15	*1,397.23							
1868	1	49.94	4	134.35		326.76	9	511.25	5	131.15	7	82.68	12	214.23	1	41.23		22	766.71							
1869								1	19.98	13	361.39	15	173.83	28	535.22	8	483.82		37	1,039.02						
1870								4	555.51	9	209.96	28	203.29	37	413.25	1	107.15	1	53.69	43	1,129.60					
1871										16	426.28	16	135.07	32	561.35				37	911.86						
1872	2	464.72	2	59.84	1	14.61	5	530.17	17	340.74	26	237.84	43	578.58	7	288.03	23	1,526.07	78	2,922.35						
1873	1	10.85						9	631.23	36	504.18	24	173.70	50	677.88	3	192.26	15	944.05	78	2,456.27					
1874	1	51.33	1	27.65	7	466.02	9	545.00	16	383.59	19	206.89	35	590.48	6	503.10			50	1,688.58						

In 1873 there was built at Norfolk one iron steam vessel of 116.44 tons.

In 1873 there were built in Virginia 1-16th of all the sailing vessels constructed in the country, having 1-23rd of the tonnage. She furnished 1-28th of all the vessels of all kinds built, and 1-224th of the tonnage.

In 1874 Virginia built 1-43rd of all the vessels made in the United States that year, having 1-270th of the tonnage. Her rank was the 9th in the number of vessels and the 19th in tonnage. She built 1-27th of the sailing vessels with 1-360th of the tonnage, and 1-45th of the steam vessels, having a prominent place in constructing these. Virginia is not credited with the building of any canal boats in 1874, an omission difficult to account for when one considers the number of miles of canal in operation in the State.

* The fractions of a ton in 1858 were reported 95ths.

SECTION II.—THE COMMERCIAL ADVANTAGES OF VIRGINIA.

Few States are as well provided by the beneficent Creator with the natural highways for coast and foreign commerce as Tidewater Virginia, for the reason that nowhere have tidal waters a richer development into navigable bays, roads, harbors, inlets, creeks and rivers that, like the members of a highly organized body, penetrate and permeate every portion of the country, so that there is at least a linear mile of tide-washed shore to every six square miles of its land surface.

Captain John Smith, of famous memory, whom intercourse with the world had made familiar with the business of the merchant, and who spoke from the deck of a large experience, was the first enlightened explorer of the wealth of water-ways pertaining to Virginia. He says in his history, "There is but one entrance by Sea into this Country, and that is at the mouth of a very goodly bay 18 or 20 myles broad. * * Within is a country that may have the prerogative over the most pleasant places knowne for large and pleasant navigable Rivers; heaven and earth never agreed better to frame a place for man's habitation."

CHESAPEAKE BAY is the most striking feature, from the commercial standpoint, not only on the map of Virginia, but also on that of the United States.

It should be noted that this is the *only great land-locked arm* of the Atlantic, the ocean of commerce, in the United States; that it *is crossed by the central parallel** of population, and is therefore nearer to more of the ends of traffic, the consumers, than any other commodious bay on the Eastern seaboard, where "nearness to Europe, the abundance of its water-power, the variety and value of its forests, its inexhaustible resources in coal and iron, and the excellence of its harbors,"† have fixed the commercial and manufacturing centres of the country.

Ranging through nearly three degrees of latitude, or some 200 miles of northing and southing in its length, and varying in width from 3 to 30 miles, expanding in all directions, and with deep and ever-fluid waters everywhere, this bay lacks no requisite as a magnificent *continental harbor*.

It may be remarked that the *drainage basin of the Ohio river alone*, considered in reference to Chesapeake Bay as a commerciating medium, would warrant the application of the term *continental* to the advantages for traffic offered by this bay. For example, the area of that basin is 207,111 square miles, four times that of England,‡ its population in 1870 was 7,806,453, it produced in that census-year 146,714,000 pounds of tobacco, 67,513,000 bushels of wheat, 231,917,000 bushels of Indian corn, 110,000 bales of cotton, and employed in manufacturing 311,000 horse-powers of steam and 132,000 of water.§ All this region and its resources is nearer to the ports of Chesapeake bay, by more than a day's run of expensive land carriage, than to any other Atlantic harbors.

In proof that advantages claimed for the Chesapeake waters as the emporia for

*See article by Prof. J. E. Hilgard, Scribner's Magazine, 1872.

†Statistical Atlas of the U. S. 1874.

‡See Table II, page 7.

§A. von Steinwehr in U. S. Statistical Atlas.

the commerce of the country concentric to it may be realized, the growth of the trade of Baltimore, situated almost at its northern extremity and 180 miles from the sea, may be cited, as shown in the following official table of the Exports and Imports of that city:

YEARS.	Domestic Exports.	Imports.
1851*.....	\$ 5,635,786	\$ 6,650,645
1858.....	9,878,386	8,930,157
1868.....	13,857,391	12,930,733
1870.....	14,330,248	19,512,468
1871.....	15,037,855	24,672,871
1872.....	18,325,321	28,836,305
1873.....	19,344,177	29,287,603
1874.....	27,513,111	29,302,138

This unexampled growth, in spite of the great commercial depression of 1873-'4, shows the advantages of location when utilized by the enterprise and opulence of great corporations and princely merchants that have opened ways of communication between the surplus products of such fertile regions as the valleys of the Ohio, the Mississippi, the Missouri and the Arkansas, and the wharves from which they may be carried, at all seasons of the year, to the lands where they are always in demand.

Seventy miles of the length of Chesapeake bay, where its width is from 14 to 30 miles, lies wholly within the territory of Virginia; it is not subject to violent storms, there are commodious harbors all along its shores, its waters are deep and generally free from obstructions. A vessel bound up it, when once fairly within the "Virginia Capes," and following the "sailing directions," runs on an air line of N. $\frac{1}{4}$ ° E. for over 50 miles. The exit and entrance can always be easily made, and without any delay, through a deep and clear channel, into this broad-armed bay, that drains more than 50,000 square miles of country.

Commodore Maury,† the noted Geographer of the Sea, remarks: "Naturally, and both in a geographical and military point of view, Norfolk with Hampton Roads at the mouth of the Chesapeake Bay as its lower harbor, and San Francisco inside of the Golden Gate in California, occupy—one on the Pacific, the other on the Atlantic—the most important maritime positions that lie within the domains of the United States. Each holds the commanding point on its sea front; each has the finest harbor on its coast; and each with the most convenient ingress and egress for ships—is as safe from wind and wave as shelter can make them. Nor is access to either ever interrupted by the frosts of winter. In the harbors of each there is

* Returns for the whole State of Maryland.

† Physical Survey of Virginia, page 4 (1868).

room to berth not only all the ships of commerce, but the navies of the world also."

The following table, from the United States Coast Survey Report for 1857, shows the character of the channels into Chesapeake bay, and from it to some of the harbors and anchorages of Virginia:

VIRGINIA HARBORS AND ANCHORAGES.	Least Water in Channel-way in feet.			
	Mean tides.		Spring tides.	
	Low water.	High water.	Low water.	High water.
Between the Capes at entrance to Hampton Roads.....	30.0	32.5	29.8	32.8
Anchorage in Hampton Roads.....	59.0	61.5	58.8	61.8
From Hampton Roads to Sewall's Point.....	25.0	27.5	24.8	27.8
South of Sewall's Point 1½ miles.....	21.0	23.5	20.8	23.8
Up to Norfolk.....	23.0	25.5	22.8	25.8
From Hampton Roads to James River, entering <i>north</i> of Newport-News Middle ground.....	22.0	24.5	21.7	24.8
Same to <i>south</i> of do.....	27.0	29.5	26.7	29.8
York river from abreast the tail of York Spit up to Yorktown.....	33.0	35.5	32.7	35.8
Elizabeth river between Norfolk and the Navy-yard.....	25.5	28.0	25.3	28.3

The broad estuary of the Chesapeake receives from Virginia many navigable rivers, the tides of which can carry large ships far into the interior, to the great advantage of the country.

THE POTOMAC, a wide and deep river, the northeastern boundary of Virginia, is navigable for 110 miles from where it enters the bay, some 65 miles from the ocean.

Alexandria, a flourishing commercial city of Virginia, is on this river, some eight miles from the head of navigation at Georgetown and Washington. It is an important centre of lines of transportation,* and many advantages for commerce, especially the coastwise trade, as its canal and railway communications are with the coal, timber, iron, &c., of the interior, that are required at other points on the Atlantic seaboard. *Alexandria* is a port of entry.

There are many landings on the Potomac, and lines of steamers and sailing vessels connect them with all portions of the country, giving great facilities for cheap transportation to a very extensive and valuable portion of the Northern Neck.

THE RAPPAHANNOCK is navigable to *Fredericksburg*, ninety-two miles from its mouth at the bay, some forty miles from the ocean, for steamers and sailing vessels, to which point the channel has *eight feet*† at low water, which it is proposed to in-

*See Chapter on Transportation. †Report of the Chief of the U. S. Engineers, 1874.

crease to ten. This river is crossed at Fredericksburg by the great North and South Line of railroad from Washington to Richmond, and a partially completed line extends westward towards Gordonsville and the Chesapeake and Ohio and Midland Railroads. The opening of this traffic route to the interior will doubtless restore to this city the commerce it formerly had, and the development of the mineral wealth not far from it will lead to an appreciation of its commercial advantages. Fredericksburg is in the customs-district of Tappahannock.

Port Royal, twenty-two miles below Fredericksburg, is accessible to vessels of a larger capacity.

Tappahannock, the port of entry for the river and the one that receives credit for all its commerce, is sixty miles below Fredericksburg, and to it vessels drawing eleven and a half feet can ascend.

Urbanna is a port some twenty-six miles below Tappahannock and seventeen miles from the bay.

Lines of steamers run on the Rappahannock, and touch not only at the ports named, but at many landings along the whole length of the river.

THE PIANKETANK is navigable for some fourteen miles, and MOBJACK BAY and its rivers furnish deep entrances to the Gloucester Peninsula.

THE YORK is a wide, deep, and almost straight *belt* of water, reaching over forty miles from the bay to the junction of the PAMUNKEY and the MATTAPONY, the rivers that form it, and that are themselves navigable for many miles for light draught vessels. Ships drawing twenty-seven feet can go to within a short distance of West Point, at the head of the York, and those requiring *thirteen feet to its wharves at low water.

Yorktown is about sixteen statute miles from the bay and thirty from the ocean. The Coast Survey Report for 1857 says of the approach to this "port of entry": "No one can look at the chart of the lower part of York river, from the entrance up to Yorktown, without pronouncing it a harbor of the first class. There is no bar at the mouth of this river, and the least water to be passed over in entering it is thirty-three feet at low tide, near the tail of York Spit, in Chesapeake bay. After passing this the water deepens to six, seven and eight fathoms, increasing in passing up the channel to eleven and twelve fathoms abreast of Yorktown, where the shore is very bold, and wharves carried out a distance of fifty feet would strike four and a half and five fathoms of water. The channel of the river is more than a mile in width, and with a few buoys and beacons judiciously placed, the heaviest line-of-battle ships could beat up and down the river without the least difficulty. Yorktown is situated about thirteen† nautical miles from the entrance of the river into Chesapeake bay. The location is elevated, and it could be easily fortified at moderate expense against attack either by land or water. It affords a harbor sufficient for the largest navy and commercial marine, and next to Newport, Rhode Island, it is, in my judgment, the safest and the most commodious harbor in the United States." Newport harbor is in an island; therefore, in the opinion of Coast Survey authority, Yorktown is the "safest and most commodious harbor" in the main land of the United States.

* U. S. Coast Survey Maps, 1866.

† A misprint in the Report makes it 30.

It is proposed to make Yorktown one of the deep water termini of the Chesapeake and Ohio Railway. In that event it is difficult to realize the future of such a harbor so situated in reference to the sea and to the interior that the completion of that railway will place it in commercial relations with.

West Point, at the head of the York, is connected with Richmond by railroad, and with Baltimore by a daily line of steamers that call at Yorktown and the other landings on the river. A line of steamers plies between Yorktown and Norfolk by way of *Mathews Courthouse* and *Cherrystone*, the port of entry of the Eastern Shore.

THE MATTAPONY is navigable to *Aylett's*, a place some thirty miles above West Point, and the PAMUNKEY to *Oyster Shell Landing*, some thirty-five miles above West Point.

THE JAMES is navigable to *Richmond*, a port of entry with a custom-house, one hundred and ten miles, for vessels drawing fourteen feet of water, and to *City Point*, at the mouth of the Appomattox, some sixty miles below Richmond, for those drawing fifteen feet. It has, as before stated, thirty feet of depth, at low water, at its entrance at *Hampton Roads*.

Richmond occupies a commanding position as a commercial and manufacturing city, with superior advantages for transportation in all directions by the many lines of railways, canal, steamers, vessels, &c., that have found there a natural centre for the accumulation and distribution of the articles of trade. Some of the advantages of its location are emphasized by the following *table, showing comparative distances between Atlantic ports and principal western railroad centres by all-rail travel, by Chesapeake and Ohio Railroad and its projected connections, and by more northerly routes.

MILES FROM PORT OF	To Cincinnati.	To Louisville.	To St. Louis.	To Memphis.	To Nashville.	To Columbus, O.	To Indianapolis.	To Chicago.	To New Orleans.
Richmond, via Chesapeake and Ohio.....	573	1640	1890	1,017	825	564	688	832	.....
Baltimore, via Baltimore and Ohio.....	591	699	931	1,076	884	517	705	828	.....
Philadelphia, via Pennsylvania Railroad.....	668	778	992	1,152	960	548	736	823	.....
New York, via Erie Railway.....	861	997	1,201	1,354	1,182	755	935	983	.....
New York, via New York Central.....	883	940	1,144	1,354	1,176	761	830	980	.....
Boston, via New York Central.....	941	998	1,202	1,426	1,234	829	888	1,038	.....
Washington, via Chesapeake and Ohio Railroad.....	593	660	910	1,037	845	.....	.....	862	.....
Washington, via Baltimore and Ohio Railroad.....	613	720	953	1,097	905	.....	.....	862	.....
Washington, via Pennsylvania Central Railroad.....	646	753	959	1,130	933	.....	.....	842	.....
New York, via Washington and Ches. and Ohio Railroad.....	888	1,138	1,265	.....	.....	.....	.....	.....	1,394
New York, via Erie and A. and G. W.....	.....	997	1,201	1,354	.....	.....	.....	.....	1,751
New York, via New York Central and L. S. and M. S.....	.....	940	1,260	1,354	.....	.....	.....	.....	1,694

There are many landings on the James and the numerous lines of steamers and sailing vessels that run regularly between Richmond and Norfolk, Baltimore,

* Compiled from pamphlet issued by Fisk & Hatch, Bankers, New York, 1873.

† Will be shortened thirteen miles by improvements now in progress.

Philadelphia, New York and other places make the trade of this noble river an active one, and furnish the best of facilities for reaching markets to all products that come to its shores.

Several of the branches of the James are navigable rivers—the APPOMATTOX, 12 miles to *Petersburg*, a port of entry and a thriving city; the CHICKAHOMINY to a considerable distance for steamers and vessels of a light draught; PAGAN CREEK is a fine stream to *Smithfield*; the NANSEMOND is navigable some fifteen miles to the flourishing town of *Suffolk*, at the intersection of the Atlantic, Mississippi and Ohio and the Seaboard and Roanoke Railways; the lower reaches of this river are broad and deep.

The ELIZABETH is a broad arm of the Hampton Roads estuary of the James, extending for twelve miles, the last four of which are expanded as the superb harbor between the cities of *Norfolk and Portsmouth*, and the Navy Yard of the United States—its most important one—at Gosport. Beyond this harbor, navigation is extended by ship canals to the navigable sounds and rivers of North Carolina. The entrance to the Elizabeth has always a depth of twenty-one feet, which at spring tides reaches 23.8, while the harbor of Norfolk and Portsmouth has from 25.5 to 28.3 feet of water.

A recent publication,* speaking of Norfolk, says: "The grand current of the Elizabeth (opposite Fort Norfolk) is so broad and deep that the largest ship that floats can swing around there. * * The trains of the Atlantic, Mississippi and Ohio Railroad discharge their freights of cotton and grain directly upon wharves at the steamers' sides, and the unusual facilities are yearly increased and improved. * The importance of Norfolk as a port for the future is certainly indisputable; and it is not at all improbable that in a few years it will have direct communication with European ports by means of ocean steamers owned and controlled in this country. * The Elizabeth river is not so lively now as when at the beginning of this century the river could not be seen, so thick was the shipping between the Norfolk and Portsmouth shores. In the financial crash which came at that time sixty Norfolk firms interested in maritime commerce failed. * * The eastern and southern branches of the Elizabeth are superior in depth to the Thames at London, or the Mersey at Liverpool. The depth of water in the harbor at Norfolk is twenty-eight feet, or nearly twice that regularly maintained at New Orleans, and the harbor is spacious enough to admit the commercial marine of the whole country. It has been estimated that thirty miles of excellent water-front for wharfage can readily be afforded. * Norfolk lies within thirty-two miles of the Atlantic. Northward stretch the Chesapeake and its tributaries, navigable nearly a thousand miles; westward is the James, giving communication with Richmond, and five hundred miles of water way; southward run the canals to Currituck, Albemarle and Pamlico, communicating with two thousand miles of river channel. She affords naturally the best seaport for most of North Carolina and Tennessee, besides large sections of Northern Georgia, Alabama, Mississippi and the Southwest. A thorough system of internal improvements in Virginia, giving lines leading from tide-water in that State to the Northwest, would enable Norfolk almost to usurp the commercial pre-emi-

*The Great South. By Edward King, 1875.

nence of New York. Pittsburg and Wheeling and Toledo are geographically nearer to the Capes of Virginia than to Sandy Hook; and it is almost certain that in the future many of the highways to the sea from the West will run through Virginia, and the ports furnishing outlets to the Western cities will be along the beautiful and capacious Chesapeake bay.”*

Lines of railways, canals, steamships and vessels of all kinds connect this port with all portions of the country. Its commercial advantages—the results of its position—can hardly be overestimated, and the growth of its cotton-trade, already described, shows that it may aspire to the first rank not only in this, but in all the export and import trade of the country.

HAMPTON ROADS, on account of its nearness to the sea, its accessibility, the depth and expansion of its waters, the thoroughly land-locked character of its situation, the condition of the surrounding land and its ample security in troublous times, may justly be called *The Harbor* of the Mid-Atlantic coast of the United States. When the storm signals are up all the shipping at sea along the Middle coast of the Union flies to Hampton Roads for refuge, and it is no uncommon sight to see hundreds of vessels of every class riding here at ease without a strain upon their anchor chains, while in sight, without the Capes, a furious storm is raging. Again, ships freighted with the precious cargoes of the tropics, but cleared for other ports where the climate is damp and uncongenial to their sensitive lading, come here to await orders and a favorable season. The London, England, Public Ledger (the merchants' journal of that world's mart), of the 13th of January, 1875, had the following statement:

Brazil Coffee in United States Ports December 30th, 1874.

New York.....	8,891	Bags.	Savannah.....	4,000	Bags.
Baltimore.....	15,786	“	Mobile.....	1,000	“
Hampton Roads.....	9,612	“	New Orleans.....	4,733	“
Richmond	2,500	“	Galveston	2,000	“
Charleston.....	2,500	“			
Total.....				51,022	“
1873.....				66,372	“

The uninformed reader would have inferred that the place reported as *second* in the possession of the stock of coffee on hand, and that held nearly *one-fifth* of the whole of this commodity—which in 1873 was imported into the United States to the value of 44 million dollars, or 1-15th of the whole import trade of the country, and in 1874 to the value of 55 million dollars, or 1-18th of the importations for the year—must be one of the most active commercial cities in the Union, and he would be surprised to learn that it is the magnificent world's-harbor, named from what is now the mere village of *Hampton*. But this leads to the inevitable conclusion that from the shores of this broad anchorage—where the Great Eastern had but to run out its gang plank to make a landing on the natural shore—this and similar products, as sugar, molasses, spices, fruits, &c., the growth of the Bahamas, the West

*These extended extracts from the Great South are given because the articles from which the book was made originally appeared in Scribner's Magazine, a leading New York monthly, and the writer is an Englishman by birth and a New Yorker by location.

Indies and the northern portions of South America, where they naturally come, in transit* to the chief markets of consumption, they should be sent inland to those points of consumption by routes shorter and cheaper than any other.

†“Commodore Maury, of Virginia, better known to science as Lieut. Maury, from his researches on the laws of currents and deep sea lore, speaking of the relative merits of Norfolk and New York as commercial harbors, says of the roadstead in the vicinity of which the deep water terminus of the Chesapeake and Ohio Railroad will be located, and which is common to vessels seeking the wharves at Norfolk, Yorktown or Newport’s News, thus describes it: ‘Geographically considered, the harbors of Norfolk or Hampton Roads and New York occupy the most important and commanding positions on the Atlantic coast of the United States. They are more convenient to the ocean than Baltimore, Philadelphia and Boston are, because they are not so far from the sea.

“Depth of water that can be carried out, and distance of the sea from

Hampton Roads, distant.....	15 miles—depth	28 feet.
New York, “	30 “ 3 $\frac{3}{4}$ fathoms,	23 “
Boston, “	100 “ 3 $\frac{1}{2}$ “	21 “
Philadelphia, “	100 “ 3 $\frac{3}{4}$ “	23 “
Baltimore, “	160 “ 2 $\frac{3}{4}$ “	16 “

“Between the three last and the sea there is a tedious bay navigation, but each of the first two is situated upon a well sheltered harbor, that opens right out upon the sea with beautiful offings, those of Hampton Roads surpassing the others in all the requirements of navigation, both as to facility of ingress and egress, certainty of land fall, depth of water, and holding ground.’

“He also shows, that to reach the Chesapeake, vessels cross the Gulf Stream at its narrower part, and take advantage of the eddies on its southeastern edge; going in the opposite direction to Europe, by following the Gulf Stream for a longer distance, will be helped along their course 50 to 100 miles per day.”

The *ship channel* from Hampton Roads to the ocean is an *air-line* of sixteen nautical miles.

The following comparative tables of distances by available routes, from the “Report of a Select Committee of the United States Senate on Transportation Routes to the Seaboard, 1874,” show the advantages of the situation of Hampton Roads (*and, consequently, of all commercial points in Virginia on the James, the York, the Elizabeth, &c.*), in reference to Western trade, whether export or import, coastwise or foreign:

	MILES.
Hampton Roads to New York, via ocean.....	293
Hampton Roads to New York, via inland† route.....	343
Hampton Roads to Philadelphia, via ocean and Delaware Bay.....	300
Hampton Roads to Philadelphia, via inland|| route.....	223
Hampton Roads to Baltimore, via Chesapeake Bay.....	200
Hampton Roads to Washington, via Chesapeake Bay and Potomac River..	182

* See maps 3 and 4.

† From a pamphlet issued by Fisk & Hatch, Bankers, New York, on the Chesapeake and Ohio Railroad, 1873.

‡ Viz: via Chesapeake Bay, Chesapeake and Delaware Canal and Delaware and Raritan Canal.

|| Viz: via Chesapeake Bay and Chesapeake and Delaware Canal.

The next table was prepared to show the advantages that would accrue to Western trade by completing the James River and Kanawha Canal (a work sure to be done at no distant day) and give an outlet to the sea by cheap water transportation through a route that is but little interrupted by ice.

DISTANCES FROM	To the Canes of Virginia.	
	To the Canes of Virginia.	To New York.
Cairo, mouth of Ohio, by rivers and James River and Kanawha Canal.....	1,301	.....
Cairo, via nearest rivers and canals.....		1,522
Cairo, via river, gulf and ocean.....		3,052
Louisville, Ky., by rivers and James River and Kanawha Canal.....	932	.....
Louisville, Ky., by nearest rivers, lake and canals.....		1,153
Louisville, Ky., by rivers, gulf and ocean.....		3,421
Louisville, Ky., by rail.....		687
Cincinnati, by rivers and James River and Kanawha Canal.....	800	.....
Cincinnati, by nearest canals, lake and river.....		1,004
Cincinnati, by rivers, gulf and ocean.....		3,553
Cincinnati, by rail.....		777
Point Pleasant, West Virginia, by James River and Kanawha Canal and rivers.....	597	.....
Point Pleasant, West Virginia, by rivers, gulf and ocean.....		3,756
Wheeling, by James River and Kanawha Canal and rivers.....	770	.....
Wheeling, by rivers, gulf and ocean.....		3,929
Pittsburg, by rivers and James River and Kanawha Canal.....	860	.....
Pittsburg, by rivers, gulf and ocean.....		4,019
Pittsburg, by rail.....		444
Memphis, by rivers and James River and Kanawha Canal.....	1,540	.....
Memphis, by river, gulf and ocean.....		2,813
Memphis, by rail.....		1,123
Memphis, by rail to Norfolk.....	921	.....
Memphis, by rail to Norfolk and ocean.....		1,214
Saint Louis, by rivers and James River and Kanawha Canal.....	1,479	.....
Saint Louis, by river, gulf and ocean.....		3,230
Saint Louis, by rivers, canals and lake.....		1,962
Saint Louis, by rail.....		1,110

NORFOLK AND PORTSMOUTH AS A COTTON-PORT have advantages for the collection and distribution of the larger portion of the immense cotton crop of the United States that may fairly be claimed as superior to those of any other, and that, against powerful competition, raised it from comparative insignificance a few years ago to the fifth rank* in 1872, and the third in 1874, among American ports in the net annual receipts of cotton.

* See following tables of cotton receipts.

The *cotton-belt* of the United States* extends from the Valley of the James, in Virginia, on the north, to that of the Rio Grande, in Texas, on the south, conforming in the line of its extension to the general trend of the Gulf and Atlantic coasts and the Appalachian mountains, but bounded on all its northwestern border by the isotherm of sixty Fahrenheit that follows the flanks of this mountain system from Virginia through the Carolinas and Georgia into Alabama, and then follows them northward through Tennessee and Kentucky into the southeastern angle of Missouri.

The largest *production of cotton** is in the middle zone of the cotton-belt—that in the Atlantic cotton States lies midway between the mountains and the sea, or in the Midland country; and the same is true of Alabama and Tennessee. while in Mississippi, Arkansas and Louisiana it is in the Valleys of the Mississippi, Yazoo, Arkansas and Red rivers, and again in Texas through the Middle country. Of the cotton crop† of 1870 (some 3,660,000 bales) 575,000, or about 6-36ths, were produced on the waters that flow directly into the Atlantic from the States of Virginia, North and South Carolina, Georgia and Florida; 864,000, or about 9-36ths, on the waters that flow into the Gulf, east of the Mississippi, from the States of Georgia, Florida, Alabama, Mississippi and a small portion of Louisiana; 110,000, or about 1-36th, on the waters that flow into the Ohio from Tennessee and Kentucky; 1,134,000, or about 13-36ths in the comparatively narrow Valley of the Mississippi and on the small rivers that run into it from the mere western borders of the States of Tennessee and Mississippi, and the eastern ones of Missouri and Arkansas, and a strip of Louisiana on each side of the river, the area of the whole being but 65,646 square miles; 112,000, or about 1-36th, on the waters of the Arkansas, in the State of the same name and in Missouri; 340,000, or about 3-36ths, on the waters of Red river, in Arkansas, Louisiana and Texas, and 325,000, or about 3-36ths, on the other waters of Texas. Memphis, on the Mississippi, in Tennessee, was nearer than any other interior city to fully half of the cotton product above enumerated.

The port of Norfolk and Portsmouth is *situated‡* in the northeastern corner of this cotton-belt, where, if that belt were extended, it would pass into the Atlantic, so that geographically in this, with its Hampton Roads, most commodious harbor of the American Atlantic, is naturally the pier-head of the cotton-zone, hither the bales naturally tend, and hence they as naturally take the steam and sails of commerce to bear them on in the same direction they have hitherto pursued, swiftly and cheaply, either coastwise, by inland tidal ways and ship canals, or along the safe coast to the domestic ports of the great cotton manufacturing centres§ of the United States, or to foreign ports, the world's cotton markets, by way of the ever-flowing Gulf stream that inclines from its course towards the Capes of Virginia, as if to invite and speed them whither the wants of trade require.

Two extensive systems of railways, that by their connections reach nearly every portion of the cotton-growing country, have their termini on the wharves of Norfolk and Portsmouth, and furnish ample facilities for the *collection* at this market of a

* See Cotton Maps of U. S. Statistical Atlas and of Census of 1870.

† See Map of River Systems of U. S., by Gen. von Steinwehr, in U. S. Statistical Atlas.

‡ See Map No. 4.

§ See Report of U. S. Senate on Transportation Routes to the Sea, page 242 (1874).

large share of the annual cotton crop. The Atlantic, Mississippi and Ohio, the representative of one of these systems, is part of a great trunk line from this port to Memphis, passing through some three hundred miles of the cotton-belt in Tennessee, Alabama and Mississippi, and terminating, as before stated, at the inland depot of half the cotton product; this road and its feeders, therefore, reaches all of the western and southwestern cotton fields. The Seaboard and Roanoke, the representative of the other system, is a portion of the Atlantic coast lines of railway that penetrate every portion of the Atlantic and Gulf cotton States, and reach, as before stated, fully 15-36ths of the yearly cotton crop. Two ship canals join the waters of this port with those of the sounds of North Carolina, that branch into a productive cotton region. These lines of internal improvements furnish communication by the shortest and cheapest routes of inland transit between the gin-houses of the planters and the warehouses and wharves of the factors and shippers, at a port where full provision is made for storing, compressing, shipping or selling cotton. The rates* of transit for cotton to this port from the interior must continue to be cheaper than to others, because the distances are shorter and the lines of transportation diverging as they do cannot combine to raise rates, at the same time the facilities for traffic are ample.

The requirements for the *reception and distribution* of cotton at this port are fully provided. The railway cars run out upon the wharves, where the largest of merchant vessels may lay alongside and receive the bales directly into their holds, saving thereby the large expense and waste incident to ports where several handlings and drayage and lighterage have to be undergone previous to shipment by sea. Powerful hydraulic presses are at hand to compress the bales so that ships can carry much more than their registered tonnage. Warehouses are provided where, safely stored, the bales can await the pleasure of their owners.

The large cotton-consuming centres of the United States are in the Middle and New England sections, where in 1870 three-fourths of all the cotton goods made in the country were manufactured; therefore, the *domestic cotton trade* is mostly to the ports of those States that are in the vicinity of the cotton mills. Norfolk and Portsmouth have the advantage of regular lines of steamers and sailing vessels to Baltimore, Philadelphia, New York, Providence and Boston—the ports of these manufacturing centres—by which the spinners may receive the raw material directly from the quays of the Virginia port, brought *without loss of direction* a considerable portion of the way between them and the producer *by cheap water carriage*, and burdened by a minimum of way charges. It is evident that this arrangement, that enables the consumer and the producer of cotton to meet half way with the least intervention of expense, delay or middlemen, must be highly advantageous to both, and must ultimately lead them to seek the market so located. The statements of the coast-wise trade that follow show that the advantages of this port for carrying on the home cotton trade have not been exaggerated.

That the enormous *foreign cotton exportation* of the country can be best conducted through this port hardly admits of question in the light of the statements that follow. It is of the first importance to a foreign consumer, like England, that

*See Report of U. S. Senate on Transportation Routes to the Sea, page 242 (1874).

manufactures nine-tenths of the world's cotton goods and imports all of its raw cotton, to obtain the raw material as cheaply as possible. To do that, it must employ the largest vessels; load them to their utmost capacity, and have them make the speediest of voyages, after they have obtained their cargoes where the producer will furnish them for the least money. It is clear that these demands of the foreign cotton-trade can be more fully met here than elsewhere. This port has deeper water at its wharves, and is more easily reached by large vessels than any other* American port. Its climate† is mild at all times, and there is neither ice nor snow to delay in the winter and spring months, when most of the cotton is shipped. The facilities for the rapid delivery of cargo on shipboard, and in the best condition for stowage, have been noted. And then the highways of the sea are but a few hours distant, and there is always unobstructed exit to as well as entrance from them. What has been done is but an earnest of what will be done hereafter, and now that the advantages of this port for the foreign cotton-trade have become known, it will doubtless speedily attain to the position of pre-eminence to which, in all respects, in this trade, it is justly entitled.

The tabular statements that follow have been compiled from the most reliable sources of information to confirm by facts the foregoing generalizations.

Previous to the war of 1861-5, Norfolk and Portsmouth were hardly known as a cotton-port, simply because there were no lines of continuous railways that penetrated the cotton-zone to bring the crop to that market. The following statement‡ shows the condition of this trade at that time, when it was a mere neighborhood business:

No. 1.

MOVEMENT OF COTTON at NORFOLK AND PORTSMOUTH, 1858 to 1861.

YEARS.	RECEIPTS (Bales).	EXPORTS.	
		Coastwise.	Foreign.
1858-'9.....	6,174	6,174	§
1859-'60.....	17,777	17,488	289
1860-'1.....	33,193	32,941	252
	57,144	56,603	541

Since the war the consolidation of existing lines of railways, the opening of new ones, the extension of ship canals, the establishment of direct trade with Europe, increased facilities for coastwise trade, the erection of powerful cotton presses, and, above all, the knowledge of the fact that the trade can be more cheaply carried on here than elsewhere, have given an impetus to the movement of cotton from this port, and raised it from the eighth to the third rank.

* See description of the harbor of Norfolk in this volume.

† See chapter on Climate.

‡ Report of Grandy & Sons, Cotton Factors, Norfolk.

§ In 1858 Richmond exported 213,351 pounds (495 bales), valued at \$28,976, and this was the only cotton exported from Virginia.

No. 2.

Statement of the DIRECT EXPORTATION of COTTON from NORFOLK AND PORTSMOUTH, 1868 to 1875.*

YEARS.	BALES.	POUNDS.	VALUE.
1868.....	.....	4,038,525	\$936,358
1869.....	.....	2,643,851	713,076
1870.....	9,652	4,289,611	1,038,304
1871.....	5,354	2,414,300	327,109
1872.....	3,854	1,750,416	372,470
1873.....	7,569	3,414,918	658,833
1874.....	20,524	9,253,710	1,434,203
1875†.....	67,212	.....	4,578,638

The Virginia cotton trade during this period was confined to this port, with the following exceptions: Richmond exported 69,985 pounds in 1868, valued at \$19,870, and in 1873 Petersburg exported 94,781 pounds (222 bales), valued at \$17,550.

No. 3.

The COTTON-TRADE (in Bales) of NORFOLK AND PORTSMOUTH for the Cotton-years (ending August 31st) named.

COTTON-YEARS.	TOTAL NET † RECEIPTS.	EXPORTATION.				TAKEN ON LOCAL ACCOUNT.
		Coastwise.	Direct.	On through bills, via other ports.	Total foreign export.	
1858-9.....	6,174	6,174	.....	.....	.....	.....
1859-60.....	17,777	17,488	289	.....	.....	.....
1860-1.....	33,193	39,941	252	.....	.....	.....
1865-6.....	59,096	.....	733	.....	.....	.....
1866-7.....	126,287	.....	14,168	.....	.....	.....
1867-8.....	155,591	.....	8,279	.....	.....	.....
1868-9.....	164,739	.....	7,527	.....	.....	.....
1869-70.....	178,352	.....	4,745	.....	.....	.....
1870-1.....	302,930	.....	5,142	.....	.....	.....
1871-2.....	258,730	254,043	4,687	.....	.....	55,000
1872-3.....	405,412	397,130	8,282‡	.....	.....	75,000
1873-4.....	472,446§	415,328	20,346	23,897	49,243	95,000
1874-5¶.....	392,235	309,636	67,312	16,645	83,457	.....

* From the Reports of the U. S. Bureau of Statistics.

† Furnished by Mr. Miller, of the Collector's office, through Col. W. H. Taylor.

‡ 1865 to 1874—report of Messrs. Grandy. 1853 to 1861—Merchants and Mechanics Exchange Report.

§ Messrs. Grandy point out an error in the Report of the U. S. Bureau of Statistics.

¶ The Norfolk Landmark makes this 467,571.

¶ Furnished by A. Tredwell, Secretary and Superintendent Norfolk and Portsmouth Cotton Exchange, through Col. W. H. Taylor.

No. 4.—The receipts for 1871-'2 reached this port—

By Atlantic, Mississippi and Ohio Railroad.....	125,598	bales.
By Seaboard and Roanoke Railroad.....	108,746	"
By Albemarle and Chesapeake and Dismal Swamp Canals..	28,386	"
Total receipts.....	258,730	"

No. 5.—*The exportation* of Cotton during the cotton-year 1874-'5, from Norfolk and Portsmouth, was as follows:*

To Great Britain..	Direct.....	63,629	
	Via New York.....	3,000	
	Via Baltimore.....	1,363	
	Via Boston.....	11,463	
	Via Philadelphia.....	500	
			89,955 bales.
To Havre, via Philadelphia.....		119	"
To Antwerp, via Philadelphia.....		200	"
To Amsterdam, direct.....		2,180	"
To Bremen, direct.....		1,403	"
To New York, direct.....		127,549	"
To Boston and Providence, direct.....		112,435	"
To Baltimore, direct.....		48,466	"
To Philadelphia, direct.....		21,186	"
Total export.....		393,493	"
On hand September 1st, 1875.....		179	"

This port has lines of steamers running to Boston, Providence, New York, Philadelphia, Baltimore, &c., that aggregated a tonnage of 32,082 in 1874, furnishing facilities for the large trade indicated above.

The trade of the cotton-year 1875-'6, for three months (September 1st to December 3d, 1875,) for this port is reported as follows ;*

No. 6.—Stock on hand August 31st, 1875.....	179	bales.
Transit receipts for the quarter.....	145,310	"
Local receipts for the quarter.....	64,278	"
Total.....	209,767	"

Exports.

To Great Britain, direct.....	31,908	
To the Continent, direct.....	1,817	
To New York, direct.....	88,661	
To Philadelphia, direct.....	10,027	
To Baltimore, direct.....	19,744	
To Boston, direct.....	25,093	
To Providence, direct.....	14,972	
		192,222 bales.
On hand and shipboard Dec. 3d, 1875.....	17,545	"

*Furnished by A. Tredwell, Esq., Secretary and Superintendent Norfolk and Portsmouth Cotton Exchange, through Col. W. H. Taylor.

The United States cotton crop* for the year ending September 1, 1875, was 3,827,845 bales, of which 2,674,448 were exported to foreign countries and 1,200,473 were taken by home spinners, of which 129,613 were consumed in the South. The average weight of the crop was 408 pounds per bale.

The Norfolk Virginian, of December 3d, 1875, furnishes the following facts: On the second of December, the ship H. S. Gregory, drawing 21 7-12ths feet, was cleared by Messrs. Reynolds Brothers from this port for Liverpool, England, with a cargo consisting of 7,176 bales of cotton, weighing 3,221,971 pounds; 10,000 tree-nails and 3,000 staves. This was the largest cargo of cotton that ever left Norfolk, and is thought to be the largest that ever left any United States port. The tonnage of the ship was 2,207 tons, and it had not the slightest difficulty in clearing its moorings.

The same day the brig R. B. Grove was cleared by Messrs. Ricks & Milhado, for Havre, with a cargo of 1,817 bales of cotton, weighing 830,898 pounds. The tonnage of this vessel is only 463, and its cargo was the largest, compared with tonnage, that ever left the port. On a voyage from New Orleans, two years ago, this brig carried 1,545 bales (707,316 pounds), so it carried from Norfolk 272 bales (23,572 pounds) more than it did from New Orleans. This was the first cargo of cotton ever shipped direct from Norfolk to Havre.

The three powerful hydraulic cotton presses that have recently been erected here have contributed largely to the above results; one of them, belonging to the Messrs. Reynolds, can compress† 800 bales a day.

The following quarterly statement is from the same—Virginian:

No. 7.

Cotton-Trade of 1874-'5 and 1875-'6 compared.

	COMPARISON OF EXPORTS.					
	1ST QUARTER OF COTTON YEAR 1875-'6.			1ST QUARTER OF COTTON YEAR 1874-'5.		
	Bales.	Pounds.	Value.	Bales.	Pounds.	Value.
September.....				93	40,508	6,325
October.....	4,440	1,975,802	276,612	1,462	667,044	100,056
November.....	18,463	8,498,150	1,133,351	11,546	5,227,862	784,147
Total.....	22,903	10,473,952	\$1,409,963	13,101	5,935,714	\$890,528
Excess of 1875-'6.....	9,802	4,538,238	\$519,435	.....	.....	.....

The above does not include the shipment of December 2d, before given.

The export trade in cotton to foreign countries from American ports has undergone many changes, as is shown by the following, but the tendency appears to be to ship from the Atlantic ports.

* Richmond Enquirer January 19, 1876.

† Cotton pamphlet of Southern Fertilizing Company, of Richmond, through Col. John Ott, Secretary.

No. 8.

Bales of COTTON EXPORTED from United States Ports to Foreign Countries, 1870 to 1873.

FROM	1870.	1871.	1872.	1873.
New Orleans.....	1,005,530	1,302,535	882,976	1,177,058
Mobile.....	200,838	237,074	137,977	132,130
South Carolina.....	97,109	175,650	111,388	160,169
Georgia.....	265,631	464,369	295,798	375,895
Texas.....	152,559	221,242	116,597	210,488
North Carolina.....	50	70	.....	1,632
Virginia.....	9,660	5,417	3,807	7,722
New York.....	413,701	667,958	373,071	573,498
Boston.....	1,677	3,005	13,128	11,128
Philadelphia.....	.....	1,380	2,108	6,792
Baltimore.....	32,162	37,567	14,311	20,943
Portland, Maine.....	.....	475	143	2,257
San Francisco.....	.....	.....	12	324
Total United States.....	2,178,917	3,166,742	1,957,314	2,679,956

No. 9.

COTTON EXPORTED from the United States, and to what Foreign Ports, year ending August 31st, 1873.*

EXPORTED TO	BALES.	EXPORTED TO	BALES.
Liverpool.....	1,842,117	Santander.....	1,280
London... ..	336	Malaga.....	7,753
Glasgow.....	701	San Sebastian, &c.....	2,543
Queenstown, Cork, &c.....	50,487	Genoa.....	36,470
Cowes, Falmouth, &c.....	11,455	Trieste.....	2,947
Havre.....	251,172	Salerno.....	844
Rouen.....	1,731	Narva.....	5,903
Amsterdam.....	32,404	Cronstadt.....	56,227
Bremen.....	191,556	Revel.....	51,426
Hamburg.....	24,691	Helsingfors.....	1,060
Antwerp.....	25,387	Mexico.....	997
Rotterdam.....	15,706	Other ports.....	783
Gottenburg and Stockholm.....	10,136	Total Export.....	2,679,986
Uddevella.....	1,650		
Barcelona.....	52,194		

* United States Bureau of Statistics—Cotton pamphlet of Southern Fertilizing Company, Richmond.

No. 10.

Export of Cotton, Foreign and Coastwise, from Southern Ports, for Cotton-Year 1873.

SHIPPING PORTS.	BALES.	
	To Foreign Ports.	To Coastwise Ports.
Charleston, South Carolina.....	160,169	225,016
Fernandina, St. Marks, &c., Florida.....		14,068
Galveston, Texas.....	210,438	133,304
Mobile, Alabama.....	132,130	197,131
New Orleans	1,177,058	228,968
North Carolina ports.....	1,632	59,898
Savannah, Georgia.....	375,895	248,752
Virginia ports.....	7,722	724,791
	2,065,044	1,831,928

No. 11.

The COTTON CROPS of 1873-'4 and 1874-'5 and RECEIPTS at the several Ports.*

STATES WHERE GROWN.	ACTUAL. (Bales.)	ESTIMATED. (Bales.)	PORTS WHERE MARKETED, &c.	ACTUAL. (Bales.)	ESTIMATED. (Bales.)
	Year ending Sept. 1, 1874.	Year ending Sept. 1, 1875.		Year ending Sept. 1, 1874.	Year ending Sept. 1, 1875.
Texas.....	500,000	550,000	Galveston, &c.....	389,045	400,000
Louisiana.....	420,000	480,000	New Orleans.	1,221,693	1,230,000
Mississippi.....	675,000	610,000	Mobile.....	299,573	375,000
Alabama.....	575,000	650,000	Florida.....	14,185	25,000
Florida.....	75,000	100,000	Savannah.....	625,857	675,000
Georgia.....	600,000	665,000	Charleston.....	438,194	475,000
South Carolina.....	400,000	400,000	North Carolina.....	57,895	90,000
North Carolina.....	225,000	275,000	Virginia†.....	505,876	450,000
Arkansas.....	400,000	360,000	New York, Boston & Baltimore..	251,962	250,000
Tennessee.....	300,000	210,000	Overland.....	237,572	200,000
			Southern consumption.....	123,526	130,000
Total crop.....	4,170,000	4,300,000	Total crop.....	4,170,383	4,300,000

The above statement shows that in 1874 Norfolk was the *third* market in the United States.

*Financial Chronicle, New York, in Cotton pamphlet of Southern Fertilizing Company.

† Norfolk received 472,446 bales of the 505,876.

No. 12.—The excellent and suggestive Cotton-port Map of the Norfolk Land-mark gives the following as the *net* receipts of cotton at the United States ports in 1874. By *net* receipts it means cotton sent *direct* to a port and that has not been counted at any other port.

1. New Orleans.....	1,186,032 bales.	9. Boston.....	40,465 bales.
2. Savannah.....	634,088 "	10. Wilmington (N. C.).....	20,729 "
3. Norfolk and Portsmouth.....	467,571 "	11. Baltimore	16,272 "
4. Charleston.....	428,352 "	12. Port Royal (S. C.).....	9,643 "
5. Galveston.....	367,053 "	13. Providence	6,038 "
6. Mobile.....	296,731 "		
7. New York.....	210,820 "		
8. Philadelphia.....	43,203 "	Total.....	3,726,997 bales.

The following table* gives the PRODUCTION, HOME CONSUMPTION, EXPORTS, &c., of the COTTON of the UNITED STATES during the period embracing the returns given for Virginia:

No. 13.

YEARS ENDING AUGUST 31.	PRODUCTION. Bales.	HOME CONSUMPTION. Bales.	EXPORTS. Bales.	AVERAGE NET WEIGHT PER BALE. Lbs.	MIDDLING UPLAND.	
					Average price per lb. in New York in cents and 100ths.	Average price per lb. in Liver- pool, in pence and 100ths.
1858-'9.....	4,018,914	927,651	3,021,403	447	12.08	6.63
1859-'60.....	4,861,292	978,043	3,774,173	461	11.00	5.97
1860-'1.....	3,849,469	843,740	3,127,568	477	13.01	8.50
1861-'2.....	No trustworthy statistics for these years.				31.29	18.37
1862-'3.....					67.31	22.46
1863-'4.....					101.50	27.17
1864-'5.....					83.38	19.11
1865-'6.....	2,269,316	666,100	1,554,664	441	43.20	15.30
1866-'7.....	2,097,254	770,030	1,557,054	444	31.59	10.98
1867-'8.....	2,519,554	906,636	1,655,816	445	24.85	10.53
1868-'9.....	2,366,467	926,374	1,465,880	444	26.01	12.12
1869-'70.....	3,122,551	865,160	2,206,480	440	23.98	9.89
1870-'1.....	4,362,317	1,110,196	2,166,742	442	16.95	8.55
1871-'2.....	3,014,351	1,237,330	1,957,314	443	20.48	10.73
1872-'3.....	3,930,508	1,201,127	2,679,986	464	18.15	9.65

Great Britain is the Cotton Market of the World, because she manufactures 9-10ths of the cotton goods that are made; therefore, in considering the cotton trade of any point, it is a matter of interest to know the facts of demand in the country that regulates the trade in this great staple.

*By B. F. Nourse, of Boston—From Cotton pamphlet of Southern Fertilizing Company, Richmond, 1875.

RAW* COTTON IMPORTED into GREAT BRITAIN, and from what Countries, 1858 to 1872.

YEARS.	United States	Mexico.	British West India Islands and British Guiana.	Colombia and Venezuela.	Brazil.	The Mediterranean, exclusive of Egypt.	Egypt.	British Possessions in the East Indies.	China.	Other Countries.	TOTAL IMPORTED.
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
1858.....	823,237,776	.....	367,808	74,114	18,617,872	15,792	38,232,320	132,722,576	.....	11,073,888	1,034,345,176
1859.....	961,707,264	.....	592,256	6,496	22,478,960	439,040	37,667,056	192,330,880	.....	10,767,120	1,225,989,072
1860.....	1,115,890,608	.....	1,050,754	225,120	17,286,864	82,544	43,954,064	204,141,168	8,920	8,303,680	1,390,988,752
1861.....	819,500,528	.....	485,304	154,896	17,290,336	587,104	40,892,096	369,040,448	.....	9,033,024	1,256,984,736
1862.....	13,624,224	3,131,620	5,563,376	1,170,736	23,339,008	6,225,856	59,012,464	392,654,928	1,766,016	17,685,344	523,973,296
1863.....	6,394,080	19,278,112	25,151,856	2,023,000	22,603,168	13,806,576	93,552,368	434,420,784	80,856,336	20,655,824	670,084,128
1864.....	14,198,688	25,539,024	26,738,992	6,500,368	38,017,504	21,755,216	125,493,648	506,527,392	86,157,008	33,770,240	894,102,384
1865.....	135,532,480	36,664,880	16,536,912	14,699,328	55,403,152	27,239,072	176,838,144	445,947,600	35,855,792	30,501,744	978,502,000
1866.....	590,061,136	352,240	3,600,362	11,599,392	68,594,400	11,510,688	118,260,800	615,302,240	5,837,440	22,419,376	1,377,514,096
1867.....	698,166,800	2,464	4,810,288	9,713,572	70,430,080	6,780,480	126,285,264	498,317,008	627,184	17,823,464	1,262,885,904
1868.....	574,478,016	.....	2,725,866	4,803,160	98,796,768	6,702,304	129,189,928	493,706,640	.....	15,339,440	1,398,761,616
1869.....	457,358,944	40,544	1,095,568	8,085,728	79,417,968	13,506,640	160,450,280	481,440,170	448	19,574,936	1,231,571,232
1870.....	716,248,848	2,016	2,314,266	4,767,056	64,234,088	11,510,912	143,710,498	341,536,608	10,598	55,031,760	1,339,367,120
1871.....	1,038,677,920	.....	2,671,536	6,882,240	86,198,800	3,777,424	176,166,480	431,209,744	102,144	82,793,488	1,778,139,776
1872.....	625,600,080	81,136	1,450,960	7,960,624	112,509,324	8,031,744	177,881,712	443,224,736	292,112	63,181,644	1,408,887,472

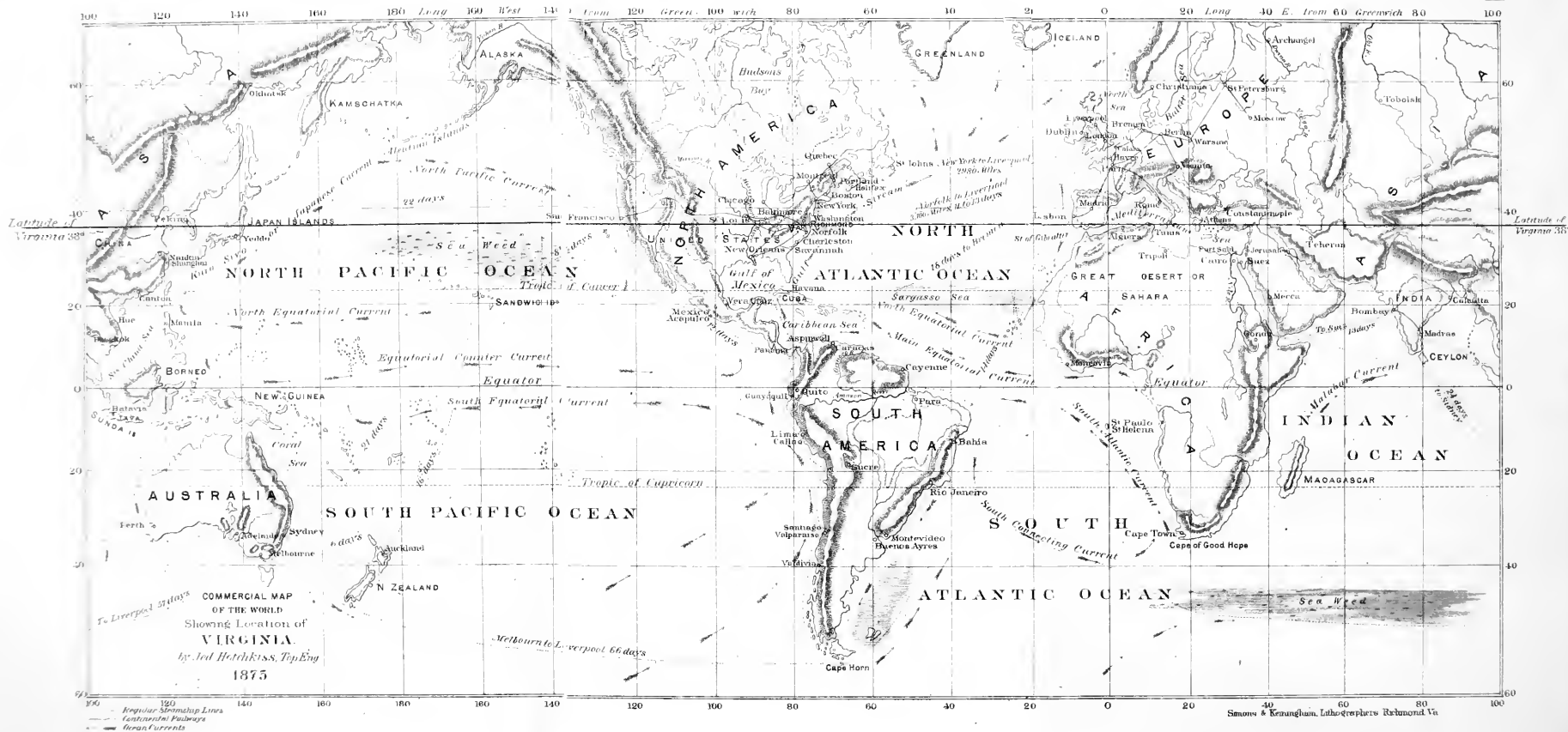
* Ellison & Co., of Liverpool—From Cotton pamphlet of Southern Fertilizing Company, Richmond, 1875.

The European Consumption of Cotton, and the Sources of Supply for 1872-'73, in bales, are summed up by M. Ott-Truempler,* of Zurich, an eminent statistician, as follows:

No. 15.

SOURCES OF SUPPLY.	English Consumption.	Continental Consumption.	Total European.
American	1,654,000	669,000	2,323,000
Indian.....	737,000	795,000	1,532,000
Brazil	509,000	144,000	653,000
Egypt	306,000	87,000	393,000
Sundry.....	129,000	189,000	318,000
Total.....	3,335,000	1,884,000	5,219,000

* Appleton's American Cyclopaedia, 1874.



VIRGINIA.

PART II—POLITICAL SUMMARY.

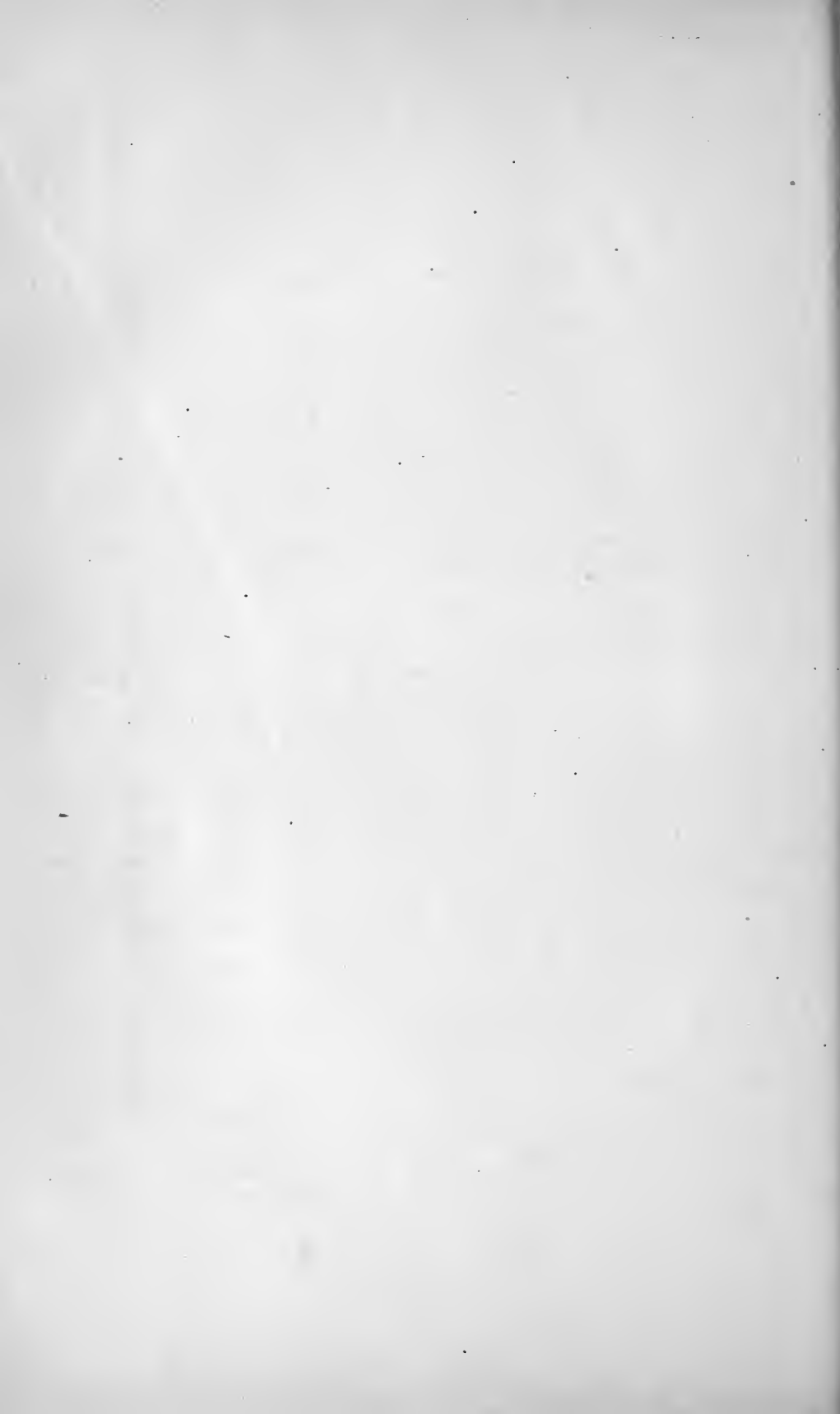
CHAPTER VII—THE POPULATION OF THE STATE.

CHAPTER VIII—RELIGIOUS ADVANTAGES.

CHAPTER IX—EDUCATIONAL ADVANTAGES.

CHAPTER X—INTERNAL IMPROVEMENTS.

CHAPTER XI—GOVERNMENT.



CHAPTER VII.

THE POPULATION OF VIRGINIA.

The statistics of the population of Virginia, compiled from the official Reports of the Censuses of the United States for 1860 and 1870, are here presented for each of the great Natural Divisions of the State as described in this summary. The results of two decades are given for comparative purposes, but it should be borne in mind that the census of 1870 followed a long and exhausting war, in which Virginia suffered a great loss of human life and destruction of the means of subsistence, as well as a dismemberment, by which she was deprived of 23,000 square miles of territory and 442,014 of population.

On the 1st of June, 1860* and 1870, the POPULATION of the SECTIONS of VIRGINIA, by NUMBERS and RACE, were as follows:

Table I.

	AGGREGATE.		WHITES.		BLACKS.	
	1860.	1870.	1860.	1870.	1860.	1870.
Tidewater.....	^(a) 344,782	^(b) 346,297	167,139	168,650	177,570	177,475
Middle	^(c) 371,035	^(d) 363,932	164,800	161,996	206,235	201,905
Piedmont.....	^(e) 209,132	^(f) 207,204	115,236	121,107	93,896	86,085
Blue Ridge.....	^(g) 24,500	^(h) 28,550	23,117	26,479	1,383	2,079
Valley.....	⁽ⁱ⁾ 194,250	^(j) 197,967	153,517	159,927	40,772	38,027
Appalachia.....	^(k) 76,901	^(l) 81,197	67,974	73,922	7,817	7,270
Virginia.....	^(m) 1,219,630	⁽ⁿ⁾ 1,225,163	691,773	712,089	527,763	512,841

Including—^(a) 83 Indians; ^(b) 170 Indians and 2 Chinese; ^(c) 2 Chinese; ^(d) 29 Indians; ^(e) 12 Indians; ^(f) 13 Indians; ^(g) 1 Indian; ^(h) 10 Indians; ⁽ⁱ⁾ 5 Indians; ^(j) 106 Indians and 2 Chinese; ^(k) 229 Indians and 4 Chinese.

The *gain*† of the entire population from 1860 to 1870‡ was .045 per cent.; the *gain* of the whites was .029 per cent.; the *loss* of the blacks was .009 per cent.

* The population is given for the territory of Virginia as it now (1874) is and as it was in 1870.

† In 1863 the State of West Virginia was created, and 50 counties of Virginia were assigned to it, but the returns here given are for Virginia as it now is.

‡ This embraces the four years of war.

The Statistical Atlas of the United States (1874) gives the following as the population of the *present* (1870) territory of Virginia, at each census—it may be considered a good approximation:

	Persons.	Persons to a Square Mile.
1790	691,737	18.05
1800	801,608	20.92
1810	869,131	22.69
1820	928,558	24.24
1830	1,034,481	27.00
1840	1,015,260	26.50
1850	1,119,348	29.11
1860	1,219,630	31.80
1870	1,225,163	31.95

The population of the United States was 31,443,381 in 1860, and 38,558,371 in 1870, in which year Virginia was the 10th State in the number of people.

The next table gives the AREA of each section and of the State and the Population to the square mile.

Table II.

	Square Miles.	1,000ths of State.	Population to Square Mile.
Tidewater	11,350	.252	30.5
Middle	12,470	.277	29.2
Piedmont.....	6,680	.149	32.5
Blue Ridge.....	1,230	.027	23.2
Valley.....	7,550	.168	26.2
Appalachia	5,720	.127	14.2
Virginia.....	45,000	1.000	27.2

The census of 1870 gives 38,348 square miles as the area of Virginia (this, as stated elsewhere, is incorrect), and on that basis gives it a population of 31.95 to the square mile. The number in 1870, in the United States, omitting the territories, was 19.21, and, including them, 10.70 to the square mile. The centre of population in the United States, according to the Statistical Atlas, was in 1820 sixteen miles

north of Woodstock, in Virginia; in 1830 it had passed to nineteen miles west south-west of Moorefield; in 1840 to sixteen miles south of Clarksburg; in 1850 to twenty-three miles southeast of Parkersburg, and in 1870 to forty-eight miles east by north of Cincinnati. The land-surface area of the United States, omitting territories, was, in 1870, 1,984,467 square miles, and including them 3,603,884. The area of land and water is about 4,000,000. So Virginia had about one forty-fourth of the area of the States and one-eightieth of the whole country.

Table III.

	NATIVE.		FOREIGN BORN.		Having one or both parents foreign.	Having foreign father.	Having foreign mother.	Having foreign father and mother
	1860.	1870.	1860.	1870.	1870.	1870.	1870.	1870.
Tidewater.....	335,640	339,440	9,232	6,817	14,526	14,109	12,560	12,143
Middle.....	367,492	359,983	4,543	3,977	9,492	8,698	7,140	6,756
Piedmont.....	208,124	206,140	1,008	1,084	2,241	2,172	1,707	1,623
Blue Ridge.....	24,454	28,512	46	46	148	143	83	78
Valley.....	192,194	193,397	2,096	1,590	3,990	3,800	2,758	2,568
Appalachia.....	75,213	80,937	1,588	260	797	755	503	461
Virginia.....	1,201,117	1,211,409	18,513	13,754	30,794	29,677	24,751	23,634

By this table (III) it appears that in 1870 over 988 out of every 1,000 of the population of Virginia were born in the United States, or that less than 12 in each thousand were foreign born. The table also shows that the foreign fathers were more numerous than the mothers—as it should, because more males come to the country than females, and marry here. The foreign population is most numerous in the sections near the sea.

Table IV is Selected Nativities of the Native Population of Virginia in 1870, showing *where* most of the people were born.

Table IV.

	NATIVES—WHERE BORN.						
	Whole Number.	Virginia or West Va.	North Carolina.	Maryland.	New York.	Tennessee	Pennsylvania
Tidewater.....	339,500	302,620	7,202	2,956	2,130	77	1,257
Middle.....	359,964	347,539	3,222	2,623	1,845	124	1,114
Piedmont.....	198,460	198,065	638	726	402	83	1,413
Blue Ridge.....	28,512	26,194	2,105	7	2	71	35
Valley.....	198,397	188,755	1,425	952	243	1,195	1,173
Appalachia.....	80,947	74,401	2,251	64	26	2,578	74
Virginia.....	1,203,780	1,137,574	16,843	7,325	4,643	4,138	4,070

Table IV reveals the fact that nine hundred and forty-five in every thousand of the population (1870) were born in Virginia or West Virginia—the latter State having so recently been taken from Virginia—and that thirty of the remaining fifty-five of the one thousand were born either in North Carolina, Maryland, New York, Tennessee or Pennsylvania—states, three of which now border on Virginia, and Pennsylvania did before West Virginia was separated. Trade with the great commercial city of New York has promoted intercourse and interchange of residence with the state in which it is situated. North Carolina touches the State a long distance, bordering most of the sections, and her children are found in all. The same is true of Maryland, save that she is remote from Blue Ridge and Appalachia. Tennessee has sent her people to the Valley and Appalachia, which adjoin her. .

Table V gives the Selected NATIVITIES of the FOREIGN-BORN Population of the Sections of Virginia in 1870.

Table V.

	Whole Num- ber.	British America.	England and Wales.	Ireland.	Scotland.	Great Britain (not stated).	Germany.	France.	Sweden and Norway.	Holland.	Italy.	Switzerland.	Austria.
Tidewater.....	6,515	111	737	3,253	349	3	2,505	253	26	40	121	67	55
Middle.....	3,999	120	850	1,535	215	.....	869	50	17	183	18	41	10
Piedmont.....	1,036	34	193	385	82	1	239	11	2	6	10	18	.....
Blue Ridge.....	46	.....	16	18	.....	.....	11	.....	.....	.....	1	.....	.....
Valley.....	1,550	51	198	714	50	1	419	44	1	2	11	21	11
Appalachia	280	8	41	173	14	.....	10	6	.....	.....	1	1	.....
Virginia.....	13,726	324	2,040	6,080	710	5	4,053	364	46	231	162	148	76

Of the foreign population, Ireland furnished nearly one-half, Germany one-third, England one-sixth and Scotland one-twentieth. The foreign population has been gathered from more than fifty different foreign States, representing all the leading nationalities of the world. Forty-nine of the foreigners are blacks from Africa, Europe, West Indies and Canada, and there are four Chinese from China. The native population is gathered from forty-one States and Territories, so that more than ninety different States are here represented.

Over 49 per cent. of the foreign-born population were found in Tidewater, where they are located in the seaport cities. Over 29 per cent. lived in the Middle country, and nearly 8 per cent. in Piedmont, while the Valley had over 11 per cent.

Of the population born in the Virginias, 659,230 were whites and 503,368 blacks, so 9,424 blacks were born in other States, of which Maryland furnished 1,679, North Carolina 6,373, South Carolina 223, and Tennessee 287; they are gathered from thirty States of the Union.

Table VI shows the condition of the Population of Virginia in 1870 in respect to SEX, RACE and NATIVITY.

Table VI.

	TOTALS.			NATIVE.			FOREIGN.		
	Whole No.	Males.	Females.	Whole No.	Males.	Females.	Whole No.	Males.	Females.
Whites.....	712,089	348,720	363,369	698,388	340,736	357,652	13,701	7,984	5,717
Blacks	440,593	214,758	225,835	440,553	214,731	225,822	40	27	13
Mulattoes.....	72,248	33,470	38,778	72,239	33,465	38,774	9	5	4
Total Negro.....	512,841	248,228	264,613	512,792	248,196	264,596	49	32	17
Indians.....	229	106	123	229	106	123	.....	.....	.....
Chinese.....	4	4	.....	.....	.....	.....	4	4	.....
Total of all Races....	1,225,163	597,058	628,105	1,211,409	559,038	622,371	13,754	8,020	5,734

This table shows that 419 out of each 1,000 of the population belong to the colored races, and 581 to the white races—in other words, seven-twelfths of the people are white and five-twelfths colored; 58 per cent. of the population being white and 42 per cent. colored.

Of the negroes, 14 per cent. are mulattoes, or mixed, and 86 per cent. blacks, or unmixed. The mulattoes generally intermarry, expressing a decided preference for the mixed over the pure negro, consequently the tendency is to increase the mixed race.

The females in all cases, except in that of foreigners, are considerably in excess of the males. Of the whites nearly 49 per cent., of the negroes a little over 48 per cent., and of the mulattoes 46 per cent., are males.

The Indians are the remnant of the once powerful Pamunkey tribes, living on a reservation.

The next tabular statement (VII) gives the statistics of what the census calls the SCHOOL, the MILITARY and the CITIZEN OR VOTING Population.

Table VII.

	School Population—5 to 18.			Military Population, 18 to 45.	Citizen Population, 21 and over.	Total Male Population.
	Male.	Female.	Total.	Male.	Male.	
Whites.....	114,561	111,026	225,587	123,124	161,569	.....
Negroes	85,510	85,644	171,154	83,488	107,691	.....
Indians.....	32	39	71	42	47	.....
Chinese .....	.....	.....	.....	4	4	.....
Natives.....	199,665	196,269	395,934	202,072	261,945	.....
Foreign.....	438	440	878	4,586	7,294	.....
All classes.....	200,103	196,709	396,812	206,653	269,242	597,058

The School Population of the State, by Report of the Superintendent of Public Instruction, for 1872-'3, was—

Table VIII.

	Males.	Females.	Total.	Aggregate.
White.....	128,967	124,444	253,411	} 424,107
Black.....	87,399	83,297	170,696	

The average percentage of these in attendance at public schools in 1872-'3 was, of whites, .255 per cent.; of blacks, .154 per cent.; or .215 for all—so that over one-fifth of the Virginia School Population, which includes *all between 5 and 21 years of age* (not 5 and 18 as in the census), actually attended the *public* schools—so that if all that attended are considered, over one-fourth of this class were receiving instruction. According to Table VII, the males of this vigorous class—the hope of the Commonwealth, those between 5 and 18*—formed 16½ per cent. of the whole population, that is, nearly *one-sixth of all* the people, while the females were 16 1-12th per cent. Nearly *one-third* of all the people in the State were between 5 and 18, a most striking fact, illustrating the vigor of the population, the healthfulness of the State, &c.

The arms-bearing population—the vigorous and active men, the bread-winners—those between 18 and 45, constituted *over one-sixth* of the population, and that, too, after this class had been more than twice decimated by war during the decade. The *white* males were nearly 60 per cent. of this class.

The voting population of Virginia includes all males over 21, except idiots and lunatics, persons convicted of bribery in any election, of embezzlement of public funds, treason or felony, and officers, soldiers, seamen or marines of the United States army or navy merely *stationed* in the State. *The citizens*, those that have the right to vote, are *all males over 21 who are citizens of the United States, who have resided in Virginia one year and in the election district three months before the election at which they may desire to vote*, excepting as above. This brings the number of voters to 266,680, or .217 per cent. of the population—over one-fifth. At the State election of 1869 the vote cast was 220,739, so that about .83 per cent. of the voters exercised their electoral privileges.

The total male population of Virginia (1870) was 597,058; that of all the United States was 19,493,565; so Virginia had over .03 per cent. of the whole, while of the natural militia (18 to 45), she had over 27 in each 1,000 of all, ranking as the 12th State, while she ranks as the 9th in the militia of *native* population.

Of the citizenship population of the United States—8,425,941—Virginia had .03½ per cent., holding the 10th rank.

The school population of the United States (5 to 18) was 12,055,443 (males, 6,086,872; females, 5,968,571); so Virginia had one-thirtieth of this class.

* The census states that of the school and military ages the *first* years are *inclusive*, the *last* *exclusive*.

The following table (IX) gives the Ages of the population, in 1870, for the State:

Table IX.

	IN 100,000.	TOTAL.	MALE.	FEMALE.
Population of Virginia.....	.....	1,225,163	597,058	628,105
<i>Under one year old.....</i>	2,922	35,802	18,071	17,731
<i>One year old.....</i>	2,960	36,261	18,480	17,781
<i>Under two years.....</i>	5,882	72,063	36,551	35,512
<i>Two years old.....</i>	3,159	38,700	19,790	18,910
<i>Under three years.....</i>	9,041	110,763	56,341	54,422
<i>Three years old.....</i>	3,026	37,681	18,436	18,645
<i>Under four years.....</i>	12,067	147,844	74,777	73,067
<i>Four years old.....</i>	2,908	35,625	18,089	17,536
<i>Under five years.....</i>	14,975	183,469	92,866	90,603
<i>Five to nine.....</i>	12,377	151,638	76,737	74,901
<i>Under ten years.....</i>	27,352	335,107	169,693	165,504
<i>Ten to fourteen.....</i>	13,258	162,436	82,976	79,460
<i>Under fifteen.....</i>	40,610	497,543	252,579	244,964
<i>Fifteen to seventeen.....</i>	6,754	82,738	40,390	42,348
<i>Under eighteen.....</i>	47,364	580,281	292,969	287,312
<i>Eighteen to nineteen.....</i>	4,163	51,006	23,946	27,060
<i>Under twenty.....</i>	51,527	631,287	316,915	314,372
<i>Twenty.....</i>	2,214	27,122	10,901	16,221
<i>Under twenty-one.....</i>	53,741	658,499	327,816	330,593
<i>Twenty-one to twenty-four.....</i>	7,476	91,596	42,892	48,704
<i>Under twenty-five.....</i>	61,217	750,005	370,708	379,297
<i>Twenty-five to twenty-nine.....</i>	7,190	88,090	38,803	49,287
<i>Under thirty.....</i>	68,407	838,095	409,511	428,584
<i>Thirty to thirty-four.....</i>	5,808	71,162	31,880	39,282
<i>Under thirty-five.....</i>	74,215	909,257	441,391	467,866
<i>Thirty-five to thirty-nine.....</i>	5,509	67,488	31,723	35,765
<i>Under forty.....</i>	79,724	976,745	473,114	503,631
<i>Forty to forty-four.....</i>	4,624	56,652	26,513	30,139
<i>Under forty-five.....</i>	84,348	1,033,397	499,627	533,770

Table IX—*Continued.*

	IN 100,000.	TOTAL.	MALE.	FEMALE.
Forty-five to forty-nine.....	4,025	49,313	24,987	24,326
Under fifty.....	88,373	1,032,710	524,614	558,096
Fifty to fifty-four.....	3,580	43,860	22,250	21,610
Under fifty-five.....	91,953	1,126,570	546,864	579,706
Fifty-five to fifty-nine.....	2,249	27,566	14,440	13,126
Under sixty.....	94,202	1,154,136	561,304	592,832
Sixty to sixty-four.....	2,305	28,221	14,652	13,569
Under sixty-five.....	96,507	1,182,357	575,956	606,401
Sixty-five to sixty-nine.....	1,380	16,916	8,896	8,110
Under seventy.....	97,887	1,199,273	584,762	614,511
Seventy to seventy-four.....	1,053	12,904	6,315	6,589
Under seventy-five.....	98,940	1,212,177	591,077	621,100
Seventy-five to seventy-nine.....	525	6,433	3,120	3,313
Under eighty.....	99,465	1,218,610	594,197	624,413
Eighty to eighty-nine.....	435	5,325	2,410	2,915
Under ninety.....	99,900	1,223,935	596,607	627,328
Ninety to ninety-nine.....	81	998	386	612
Under one hundred.....	99,981	1,224,933	596,993	627,940
One hundred, &c.....	19	230	65	165

There were 890,056 ten years and over in age, and of these 412,665, over 46 per cent., had occupation of some kind. Of the 96,439 males between 10 and 15, over 35 per cent., or 33,954, were employed; and of the 93,576 females of the same class, 14,392, or about 15 per cent., had occupation. Of the 295,262 males between 16 and 59, 275,501, or over 93 per cent., were actively employed, and of the 333,752 females of same age, 58,026, or over 17 per cent., had occupation. Of the 35,754 males that were 60 and over, 28,009, or about 80 per cent., were still of the occupied class, while of the 35,273 females, only 2,783, or less than 8 per cent., were of the busy class. Of all that were 10 and over, 244,550, or more than 59 per cent. were engaged in agriculture; 98,521, over 23 per cent., were in professional and personal service; 20,181, about 5 per cent., in trade and transportation; and 49,413, about 12 per cent., in manufactures and mining.

Table X.
Population of Virginia by Ages and Sexes.

AGES.	IN 100,000.	TOTAL.	MALE.	FEMALE.
Under 1.....	2,922	35,802	18,071	17,731
1.....	2,960	36,261	18,480	17,781
2.....	3,159	38,700	19,790	18,910
3.....	3,026	37,081	18,436	18,645
4.....	2,908	35,625	18,089	17,536
5 to 9.....	12,377	151,638	76,737	74,901
10 to 14.....	13,258	162,436	82,976	79,460
15 to 17.....	6,754	82,738	40,390	42,348
18 to 19.....	4,163	51,006	23,946	27,060
20.....	2,214	27,122	10,901	16,221
21 to 24.....	7,476	91,596	42,892	48,704
25 to 29.....	7,190	88,090	38,803	49,287
30 to 34.....	5,808	71,162	31,880	39,282
35 to 39.....	5,509	67,488	31,723	35,765
40 to 44.....	4,624	56,652	26,513	30,139
45 to 49.....	4,025	49,313	24,987	24,326
50 to 54.....	3,588	43,860	22,250	21,610
55 to 59.....	2,249	27,566	14,444	13,126
60 to 64.....	2,305	28,221	14,652	13,569
65 to 69.....	1,380	16,916	8,806	8,810
70 to 74.....	1,053	12,904	6,315	6,589
75 to 79.....	525	6,433	3,120	3,313
80 to 89.....	435	5,325	2,410	2,915
90 to 99.....	81	998	386	612
100 and over.....	19	230	65	165
	100,000	1,225,163	597,058	628,105

This table (X) is instructive, showing at a glance the number of people in the State at twenty-five different periods of human life, and the same for each of the sexes. It also shows the composition of any 100,000 of the inhabitants, from which the proportion or percentage those of any given age bear to the whole may be readily ascertained.

If space permitted, comparisons could be made with other states, which would show that the climate of Virginia must be exceedingly favorable to the duration of life, compared with other sections. A few examples, taken from the old settled states, must suffice. Selecting the period of 21 to 24 years of age, in 100,000, Virginia had 7,476; Maryland 7,202; New Hampshire 7,071; New York 7,059; Illinois 7,367; North Carolina 6,840; and the average for the United States was 7,475. Again, taking the period of 50 to 54 years of age, Virginia had, in the same ratio, 3,580, Illinois 3,228; Kentucky 3,089; and the United States 3,548. The average of the United States, from 75 to 79, was 455; the number in Virginia was 525; in Maryland 458; Kentucky 388; North Carolina 464; Tennessee 358; Texas 169, and Pennsylvania 15. Taking the age from 90 to 99, the United States average in 100,000 was 43; the number in Virginia was 81; in Pennsylvania 38; in Ohio 38; in New York 43; in Kentucky 45; in Connecticut 65; in Maryland 49, and in Missouri 17. Of those over 100 years old, Virginia had 19 in the 100,000; the average in the United States 9; Connecticut had 4; Massachusetts 3; Maryland 12; Pennsylvania 3, and New York 4.

The next table (XI) shows the population of the State in 1870, by *Ages and Colors*. The census does not give the numbers for each 100,000 in these cases. This table (XI) embraces the same persons as table X, only they are here separated so as to show the numbers of each race.

Table XI.

	WHITES.			BLACKS.		
	Total.	Males.	Females.	Total.	Males.	Females.
All ages.....	712,089	348,720	363,369	512,841	248,228	264,613
Under 1.....	20,043	10,227	9,816	15,755	7,842	7,913
1.....	19,952	10,280	9,672	16,392	8,195	8,197
Under 2.....	39,995	20,507	19,488	32,057	16,037	16,020
2.....	21,424	11,114	10,310	17,271	8,674	8,597
Under 3.....	61,419	31,021	29,798	49,328	24,711	24,617
3.....	20,233	10,088	10,145	16,842	8,344	8,498
Under 4.....	81,652	41,709	39,943	66,170	33,055	33,115
4.....	19,304	9,939	9,365	16,313	8,146	8,167
Under 5.....	100,956	51,648	49,308	82,483	41,201	41,282
5 to 9.....	83,701	42,750	40,951	67,908	33,975	33,933
Under 10.....	184,657	94,398	90,259	150,391	75,176	75,215
10 to 14.....	93,060	47,652	45,408	69,352	35,314	34,038
Under 15.....	277,717	142,050	135,667	219,743	110,490	109,253

TABLE XI—*Continued.*

	WHITES.			BLACKS.		
	Total.	Males.	Females.	Total.	Males.	Females.
15 to 17.....	48,826	24,159	24,667	33,894	16,221	17,673
Under 18.....	326,543	166,209	160,334	253,637	126,711	126,926
18 to 19.....	39,267	14,423	15,844	29,728	9,517	11,211
Under 20.....	356,810	189,632	176,178	274,365	136,228	138,137
20.....	14,933	6,588	8,375	12,151	4,309	7,842
Under 21.....	371,773	187,220	184,553	286,515	149,537	145,979
21 to 24.....	55,857	26,431	29,426	35,726	16,454	19,272
Under 25.....	427,639	213,651	213,979	322,242	156,991	165,251
25 to 29.....	51,493	23,029	28,464	36,579	15,767	20,812
Under 30.....	479,123	236,689	242,433	358,821	172,758	186,063
30 to 34.....	42,701	19,091	23,610	28,447	12,787	15,660
Under 35.....	521,824	255,771	266,053	387,268	185,545	201,723
35 to 39.....	39,935	18,526	21,409	27,539	13,191	14,348
Under 40.....	561,759	274,297	287,462	414,807	198,736	216,071
40 to 44.....	32,621	15,036	17,585	24,010	11,463	12,447
Under 45.....	594,380	289,333	305,047	438,817	210,199	228,618
45 to 49.....	30,206	15,145	15,061	19,095	9,839	9,256
Under 50.....	624,586	304,478	320,108	457,912	220,638	237,874
50 to 54.....	26,615	13,478	13,137	17,236	8,767	8,469
Under 55.....	651,201	317,956	333,245	475,148	228,805	246,343
55 to 59.....	18,267	9,499	8,768	9,296	4,940	4,356
Under 60.....	669,468	327,455	342,013	484,444	233,745	250,699
60 to 64.....	16,840	8,621	8,219	11,378	6,029	5,349
Under 65.....	686,308	336,076	350,232	495,822	239,774	256,048
65 to 69.....	10,773	5,508	5,265	6,142	3,297	2,845
Under 70.....	697,081	341,584	355,497	501,964	243,071	258,893
70 to 74.....	7,684	3,739	3,945	5,215	2,573	2,642
Under 75.....	704,765	345,323	359,442	507,179	245,644	261,535
75 to 79.....	3,943	1,887	2,056	2,490	1,233	1,257
Under 80.....	708,708	347,210	361,498	509,669	246,877	262,792

TABLE XI—*Concluded.*

	WHITES.			BLACKS.		
	Total.	Males.	Females.	Total.	Males.	Females.
80 to 89.....	2,955	1,345	1,610	3,370	1,065	1,305
Under 90.....	711,663	348,555	363,108	512,039	247,942	264,097
90 to 99.....	398	156	242	600	230	370
Under 100.....	712,061	348,711	363,350	512,639	248,172	264,467
100, &c.....	28	9	19	202	56	146

By this table (XI) among the whites the males exceeded the females for all ages up to 15, except in the class of 3-year olds; from 15 to 45 the females were in excess; from 45 to 70 the males exceeded, and from 70 on the females. Among the blacks the females were in excess under 1; the males from 1 to 3; the females at 3 and 4; the males from 5 to 18; the females from 18 to 45; the males from 45 to 70, and the females from 70 on. These returns are by no means as reliable for the ages of the blacks as for those of the whites.

The white males between 15 and 17 exceeded the black 7,938; the white males under 21 exceeded the black 46,683, and under 45 the excess was 79,134. Of the whole male population the whites were in a majority of 100,492. Among the whites the males were 48.9 per cent. of all, and among the blacks they were 48.4 per cent.

In this connection it may be well to note the deaths in Virginia, by ages, during the census year 1870, as stated in the United States mortality tables of that year.

AGE.	Males.	Females.	AGE.	Males.	Females.
Unknown.....	6	3	35 to 40.....	230	309
Under 1.....	1,798	1,575	40 to 45.....	229	263
1.....	680	624	45 to 50.....	257	202
2.....	397	406	50 to 55.....	290	244
3.....	225	199	55 to 60.....	224	162
4.....	124	143	60 to 65.....	301	278
Total under 5.....	3,224	2,947	65 to 70.....	255	230
5 to 10.....	365	328	70 to 75.....	277	266
10 to 15.....	239	291	75 to 80.....	188	183
15 to 20.....	306	335	80 to 85.....	196	188
20 to 25.....	362	471	85 to 90.....	80	87
25 to 30.....	241	365	90 to 95.....	41	44
30 to 35.....	207	330	95 and over.....	34	55
			Total.....	7,552	7,631
			Aggregate.....		15,183

Over 42 per cent. of the males that died were under 5, while of the females of this class but 38 per cent. died. In Missouri over 48 per cent. of the male and 47 per cent. of the female deaths were of those under 5, and in Illinois over 50 per cent. of the deaths, both of males and females, were of those under 5.

The following table (XII) gives the number of people in Virginia over 80 years of age, by sexes:

Table XII.

ALL AGES.	TOTAL.	MALE.	FEMALE.
80 and over.....	6,553	2,861	3,692
80.....	2,319	973	1,346
81.....	388	207	181
82.....	437	207	230
83.....	390	209	190
84.....	443	217	226
85.....	573	246	327
86.....	244	111	133
87.....	240	113	127
88.....	172	79	98
89.....	114	57	57
90.....	461	188	273
91.....	88	35	53
92.....	75	24	51
93.....	56	22	34
94.....	63	29	34
95.....	111	31	80
96.....	45	20	25
97.....	29	15	14
98.....	49	16	33
99.....	21	6	15
100 and over.....	230	65	165

The males were in excess of the females at 81, 83 and 85, and of equal number at 89. The whole number of this class in the United States was 149,252 (68,250 males, 81,002 females); so Virginia had .044 per cent. of all. Of the population of the United States, .003 per cent. belonged to this class of persons over 80, while Virginia had over .005 per cent. of her population in it.

The Blind Population of Virginia was, in 1870, as follows:

Males.....	455	Black males.....	175
Females.....	440	Black females.....	192
White males.....	272	Mulatto males.....	8
White females.....	214	Mulatto females.....	34
Total whites.....	486	Total negroes.....	409
		Aggregate.....	895

These were all natives of the United States but 18 males and 2 females, white, who were born in Great Britain and Ireland (14 of them in Ireland, 13 males); all the rest were born in Virginia and West Virginia, except 7 whites and 2 negroes in Maryland, 1 white in Massachusetts, 2 in New York, 1 in Ohio, 5 in Pennsylvania, 3 in Tennessee, 1 in Vermont, 3 in the District of Columbia, and 9 whites and 4 blacks in North Carolina.

The proportion of this unfortunate class to the whole population was .0007 per cent.; in the whole United States it was .0005. The number in Virginia over the average is readily explained. Her excellent Institution—a State charity—for this class brings them to the State to be educated. (See Education).

Forty blind attended that Institution in 1872-'3. The ages of the blind of all classes were: 1 under 1 year; 12 from 1 to 5; 29 from 5 to 10; 55 from 10 to 15; 46 from 15 to 20; 89 from 20 to 30; 73 from 30 to 40; 100 from 40 to 50; 91 from 50 to 60; 119 from 60 to 70; 148 from 70 to 80; 85 from 80 to 90; 35 from 90 to 100, and 11 over 100. The State has made most liberal provision for the education of all the young blind, whether rich or poor, belonging to it.

The Deaf-Mute Population of Virginia in 1870 was—

Aggregate.....	534	Black males.....	65
	—	Black females.....	52
Males.....	293	Mulatto males.....	10
Females.....	236	Mulatto females.....	6
White males.....	223	Total negroes.....	133
White females.....	178		
Total whites.....	401	Total in United States.....	16,205

These were all natives of the United States, except one male and one female born in Ireland, and all born in Virginia or West Virginia, except 1 white in Alabama, 1 in Louisiana, 4 in Maryland, 1 in Mississippi, 2 in North Carolina, 1 in Pennsylvania, 1 in Tennessee, and 1 mulatto in Maryland. Provision is also made for the education and training of this class of unfortunates by Virginia. (See Education). The ages of the deaf and dumb were: 14 from 1 to 5 years; 41 from 5 to 10; 106 from 10 to 15; 75 from 15 to 20; 116 from 20 to 30; 73 from 30 to 40; 51 from 40 to 50; 24 from 50 to 60; 21 from 60 to 70; 12 from 70 to 80; and 1 between 90 and 100. Eighty deaf-mutes attended the State Institution in 1872-'3.

The Idiotic Population of Virginia in 1870 was—

Males.....	691	Black males.....	212
Females.....	439	Black females.....	131
White males.....	428	Mulatto males.....	51
White females.....	280	Mulatto females.....	23
Total white.....	708	Negroes—total.....	422
		Aggregate.....	1,130

These were all born in the United States but 1 white male from Australia, and the rest in the State and West Virginia, except 2 from Kentucky, 2 white and 3 black from Maryland, 1 from Missouri, 1 from New Jersey, 2 from New York, 14 white and 2 black from North Carolina, 5 from Tennessee, 1 from Texas and 1 from the District of Columbia.

No provision has been made for this class in Virginia, but there are private institutions for training them in the United States.

The Insane in Virginia in 1870 were—

Aggregate.....	1,125	Black males.....	99
		Black females.....	117
Males.....	595	Mulatto males.....	20
Females.....	530	Mulatto females.....	20
White males.....	475	Total negroes.....	256
White females.....	393	Indian males.....	1
Total white.....	868	Insane in United States.....	37,432

Of these, 17 white males and 1 female were born in foreign countries (6 males and 5 females in Germany, and 11 males and 1 female in Great Britain and Ireland). Of the natives 2 were born in Alabama, 1 in Indiana, 4 whites and 1 black in Maryland, 1 each in Missouri, New York, Pennsylvania and South Carolina, 4 in North Carolina, 7 in Tennessee; all others were born in Virginia and West Virginia. Two of the insane were under 5 years old; 1 from 5 to 10; 24 from 10 to 15; 46 from 15 to 20; 216 from 20 to 30; 230 from 30 to 40; 246 from 40 to 50; 174 from 50 to 60; 108 from 60 to 70; 53 from 70 to 80; 21 from 80 to 90; 3 from 90 to 100, and 1 over 100.

The Commonwealth of Virginia has made liberal provision for this class of her people.

The *Eastern Lunatic Asylum* of Virginia, at Williamsburg, in Tidewater, the oldest institution of the kind in America, has been in existence over 100 years. This asylum treated 311 patients in 1873. Of the 62 admitted that year for the first time, 17 died and 21 were discharged recovered. The report of the superintendent for the year ending September 30th, 1875, states that at that time there were 305 patients in this asylum (140 males and 164 females). Eight of these paid in full and five in part for their support, while 292 were cared for by the State. Of the 33 discharged, over 71 per cent. were cured. The deaths among those under treatment were 5.1 per cent. This asylum has a farm, garden and work shops attached.

The *Western Lunatic Asylum* at Staunton, in the Valley, has been in operation 45 years. This asylum treated 449 patients in 1872 and '3. There were admitted in the 2 years 107; discharged recovered 68, and 38 died. From the opening of this asylum in 1828, to September 30th, 1875, it had treated 2,614 (1,549 males and 1,065 females), of which 1,125 were discharged as cured of insanity, 240 as improved, 155 as not improved, while 738 died and 356 remained. The percentage of recoveries to admissions was 43.03 (41.58 of males and 45.16 of females). The deaths in 1875 were but 4 per cent. of the patients.

The *Central Lunatic Asylum*, at Richmond, is the first one established in America for the colored people exclusively. In 1872-'3 there were treated there 250 patients; 35 were discharged and 21 died.

All these great charities are well conducted and compare favorably with the best.

The census of 1870 gives the number of persons born in each month of that census year and surviving at the end of the year, with the following results for Virginia:

WHEN BORN.	NUMBER BORN.			
1869—June	423	}	3,479	} 11,713
July.....	1,101			
August	1,955			
September.....	2,576	}	8,234	
October.....	2,805			
November	2,853			
December.....	3,955	}	11,388	} 35,802 for the year.
1870—January	3,611			
February.....	3,822			
March.....	4,152	}	24,089	
April.....	4,254			
May.....	4,295			

It appears from this tabulation that of the vigorous children begotten in Virginia the month of May produced the most, nearly 12 per cent. of all, and June the least, or about 1.1 per cent. Considering the production by seasons, spring had over 35 per cent. of the year's product, while summer had but about 9. More than half the births of the "surviving" infants occurred in winter and spring. It seems that in Connecticut and Massachusetts May is the birth-month, as in Virginia, while in Maine, Ohio and Missouri it is in March.

In the last 9 months 32,324 were born; the number in 1860, for the year, was 35,244. The number of living persons in the State to each one of these that survived was 34.22 in 1870 and 34.61 in 1860.

By table IX there were 2,922 in the 100,000 of the population of Virginia in 1870 that were under 1 year old. The proportion for the United States was 2,854; for England and Wales in 1861 it was 2,959; for France (1861), 2,169; for Italy (1861), 3,319; for Norway, 3,042. The *observed* number for the United States is given; but the *adjusted* number is 3,212, in which proportion the Virginia number would be 3,288—a most favorable showing for the State. The same comparison could be made for other ages.

POPULATION OF THE CITIES AND TOWNS OF VIRGINIA *containing over 1,000 inhabitants in 1870.*

The cities in the following table (XIII) are assigned to Tidewater, because they are mostly commercial ones, although some of them belong to Middle Virginia counties and have most of their territory in that section.

Table XIII.

CITY.		COUNTY.	AGGREGATE.		WHITE.		NEGRO.		NATIVE	FOR'GN.
			1860.	1870.	1860.	1870.	1860.	1870.	1870.	1870.
Middle and Tidewater.	Richmond.....	Henrico.....	37,907	51,033	23,632	27,923	14,275	23,110	47,260	3,773
	Petersburg.....	Dinwiddie...	18,266	18,505	9,342	8,744	8,924	10,185	18,505	445
	Alexandria	Alexandria..	12,652	13,570	9,851	8,269	2,801	5,300	12,763	807
	Fredericksburg	Spotsylvania	5,022	4,046	3,309	2,715	1,713	1,331	3,867	179
	Manchester....	Chesterfield.	2,793	2,599	1,828	1,517	965	1,082	2,559	49
Tidewater.	Norfolk.....	Norfolk.....	14,620	19,229	10,290	10,462	4,330	8,766	18,499	739
	Portsmouth....	Norfolk.....	9,438	10,492	8,011	6,874	1,477	3,617	10,016	476
	Hampton.....	Elizabeth C'y	1,843	2,300	993	469	855	1,840	2,282	13
	Williamsburg..	James City..	2,732	1,392	974	893	137	499	1,340	52

The first group, located at the head of tide, at the lower falls of the rivers, and in two sections, are *manufacturing* as well as *commercial* cities. They *all* have a great supply of water power to turn machinery, and at the same time the advantage of the tides that float shipping to the very doors of the manufactories and open the way for commerce. No places can be more favorably situated for these purposes, having communications inland to the sources of supply of raw material and being in a climate where frost rarely clogs the wheels of machinery or closes the waterways of navigation. Richmond and Manchester are really but one city, separated by the James river, which is spanned by several bridges.

The second group includes the purely commercial cities of the State. Norfolk and Portsmouth are in reality but one—they have the same harbor; they are most favorably located for commerce, having a harbor that is deep, commodious, land-locked, always accessible, at the sea, and yet so far inland that they have 10 hours advantage over most others in nearness to the Great West.

A study of the tables will give the character of the population; it is rarely that cities have so few foreigners. Richmond and Petersburg are largely engaged in the manufacture of tobacco, and as most of the labor employed in that important and valuable industry is negro, so those cities have a large number of that class in their population.

In Middle Virginia proper the towns of any size are few—it is a planting region; but, as before stated, it has a claim to all the first group just given; it also has an interest in Lynchburg on its Piedmont border.

Table XIV.

Cities and Towns of Middle Virginia.

TOWN.	COUNTY.	AGGREGATE.		WHITES.		BLACKS.		NATIVES.	FOREIGN.
		1860.	1870.	1860.	1870.	1860.	1870.	1870.	1870.
Danville.....	Pittsylvania....	.....	3,463	.....	1,398	.....	2,065	3,433	30
Farmville.....	Prince Edward	1,536	1,543	683	598	853	945	1,518	25

Danville is an important tobacco manufacturing city.

The Piedmont cities and towns are subjoined in Table XV of Population:

CITY, &c.	COUNTY.	AGGREGATE.		WHITE.		NEGRO.		NATIVE.	FOREIGN.
		1860.	1870.	1860.	1870.	1860.	1870.	1870.	1870.
Lynchburg....	Campbell.....	6,853	6,825	3,802	3,472	3,051	3,353	6,554	271
Charlottesville.	Albemarle.....	*	2,538	*	1,365	*	1,473	2,748	90
Culpeper.....	Culpeper.....	1,056	1,800	519	1,000	537	800	1,740	60
Warrenton	Fauquier.....	604	1,256	564	704	40	552	1,214	42
Liberty	Bedford.....	722	1,208	399	519	323	689	1,202	6
Leesburg	Loudoun.....	†	1,144	1,083	791	†	353	1,134	10

As before stated, Lynchburg belongs to both Middle and Piedmont; it is largely engaged in tobacco manufacture, and therefore employs a large negro population. Charlottesville is the seat of the University of Virginia.

The next table (XVI) presents the *Cities and Towns of the Valley*:

CITY, &c.	COUNTY.	AGGREGATE.		WHITES.		NEGROES.		NATIVE.	FOREIGN.
		1860.	1870.	1860.	1870.	1860.	1870.	1870.	1870.
Staunton	Augusta.....	3,875	5,120	2,865	3,585	1,010	1,535	4,895	225
Winchester....	Frederick.....	4,392	4,477	3,004	3,100	1,388	1,377	4,375	102
Lexington.....	Rockbridge....	2,135	2,873	1,438	1,982	697	891	2,810	63
Harrisonburg..	Rockingham...	†	2,036	1,023	1,409	†	627	1,978	53
Wytheville.....	Wythe.....	1,111	†1,671	1,069	1,198	42	473	1,635	36
Salem.....	Roanoke.....	612	1,355	590	855	522	500	1,346	9

All these towns have of late increased in population. Staunton is reckoned a city in the State organizations; it owes much of its prosperity to the 3 female colleges and 2 State asylums there located.

Harrisonburg, Winchester, and Wytheville are county towns of large counties. Lexington is the seat of Washington and Lee University and the Virginia Military

*No census. †Blacks not separated. ‡3 Indians included. §Does not include all the blacks.

Institute, making it an important town. Salem is the seat of Roanoke College. In all these towns the white population exceeds the negro.

The Appalachian country and Blue Ridge are pastoral regions, having no towns of any size.

PAUPERISM and CRIME.

The census of 1870 gives the statistics of these two social evils, with the following figures, for Virginia:

Population.....	1,225,163	Number supported by public charity	
Whites	712,089	in the year.....	3,890
Negroes	512,841	Cost of supporting.....	\$303,081
Natives	1,211,409	Cost of each (average).....	\$77.91
Foreigners.....	13,754	Number receiving support June 1, 1870	3,289
		Natives (whites 3,254, negroes 1,942)...	3,254
		Foreigners.....	26

These statistics show that only some 317 in each 10,000 of the inhabitants were under the necessity of asking for public charity—a very small proportion when contrasted with other states, and proving how abundant are the means of livelihood and how small a burden is laid upon the tax payers for the support of paupers. Beggary is almost entirely unknown. The cost of pauperism is only 24 cents to each of the population.

The tables of crime show that there were only 1,090 convictions during the year, or less than 9 for each 10,000 of the population. On the 1st of June there were in all the prisons of the State 1,244 prisoners; of these 1,232 were natives (331 whites and 901 negroes); 12 were foreigners—so that only 10 in 10,000 were held in jails or prisons. Of course many of these were for minor offences and persons awaiting trial.

These facts indicate that in Virginia there is an exceptional freedom from these too great national curses, an elevated and healthy condition of public morals and a general independence in living.

The report of the Superintendent of the Virginia Penitentiary—the *only prison in the State*—for 1872-'3, shows that only 216 persons were committed to it during that year; 33 of these were whites and 181 were negroes. This is only about 1 in 5,000 of the population. Only 54 of these were committed for crimes against the person. The remaining 162 were for crimes against property; 10 for petit larceny, the second offence; 36 for house-breaking; 13 for house-breaking and larceny; 26 for burglary; 39 for grand larceny; 10 for felony; 10 for murder in the second degree (*none* in the first degree); 1 for unlawful voting; 3 for obtaining goods under false pretences; 15 for rape and attempt at rape.

The whole number confined in the Penitentiary for the same time was 759, of which 150 were whites and 609 negroes. Virginia punishes with imprisonment for a number of offences that in other states are accounted among minor delinquencies; her laws are very stringent for all offences against the person, even debarring from the rights of citizenship those that act as seconds in duels, as well as the principals, even when no fatal results follow.

These facts, taken in connection with the statement that the State has a territory of 45,000 square miles, one and a fourth million people, and a city with sixty thousand inhabitants, speak volumes for the moral condition of the body politic in Virginia. Taine says: "the aim of every society is that each one should be always his own constable, and end by not having any other." Virginia can claim as near an approach to this as any known country.

CHAPTER VIII.

RELIGIOUS ADVANTAGES.

In proportion to its population, there is no portion of the United States* better supplied with church organizations and churches than Virginia, and in none is there a more "generous provision for the ordinances of the gospel," a more able and zealous ministry, or a more conscientious observance of religious duties, including the consecration of the Sabbath.

The following table gives the census returns of all the denominations in the State:

Table I.

	1870.				1860.		
	Organiza- tions.	Buildings.	Sittings.	Property.	Churches.	Accommo- dations.	Property.
Methodists (Episcopal)	1,011	901	270,617	\$1,449,565	1,403	438,344	\$1,619,010
Baptists (Regular)	795	749	240,075	1,279,048	787	298,029	1,243,505
Baptists (other)	54	44	16,755	66,000	41	19,475	38,925
Presbyterians (Regular)	204	200	70,065	837,450	290	117,394	901,020
Presbyterians (other)					10	3,100	20,075
Episcopal (Protestant)	185	177	60,105	843,210	188	68,493	873,120
Christian	100	88	29,225	92,170	73	24,085	72,590
Lutheran	80	73	25,350	160,800	69	24,675	156,600
United Brethren in Christ	42	30	7,700	23,300			
Reformed Church in U. S. (German)	24	16	5,900	38,500	12	4,600	24,400
Friends	12	13	4,925	35,625	17	5,800	37,950
Roman Catholic	19	17	9,500	343,750	33	16,650	329,300
Jewish	8	7	1,590	35,200	3	700	10,500
Reformed Church in America (Dutch)	1	1	100	350			
Moravian (Unitas Fratrum)	1	1	350	1,500	1	350	1,000
New Jerusalem (Swedenborgian)	3	3	550	2,200	1	100	500
Universalists					2	750	10,200
Unknown (Local Missions)	1	1	150	6,000			
Unknown (Union)	42	84	21,570	62,690	175	46,050	121,000
	2,532	2,405	763,127	\$5,277,368	3,103	1,067,840	\$5,459,605

* See Plate XXXI of Statistical Atlas of the United States; also address of Dr. Hoge to Evangelical Alliance 1873.

In 1860 there were "accommodations" for over 87 per cent. of the entire population, and in 1870 for over 62 per cent. The average for the United States in 1860 was 69 per cent. There was in Virginia in 1860 a church to each 394 of the population, and in 1870 one for each 507. In New England in 1870 there was 1 church for 643 people. In the United States in 1860 there was a church to each 584. The sects in Virginia are not numerous when compared with other sections, and nearly all are included in 8 leading denominations. The most cordial relations exist between the different denominations, and they often unite their efforts in Christian labor. Sunday schools are diligently maintained by all for the religious instruction of the young, and the best talent in the churches is enlisted in their work. The clergy, with rare exceptions, confine themselves to the duties of their calling, or kindred work, the sentiment of the people being opposed to their taking part in politics, &c.

The census returns of 1860 and 1870 differ in their church statistics; the former give only the number of churches, making no distinction between organizations and churches; the latter give both, and show that nearly every organization in Virginia has a place for worship.

The leading denomination, it appears from these statistics, is the Methodist Episcopal, the American organization of the church of Wesley and his followers in England. This denomination has two colleges and numerous high schools in the State. The Baptists are second in number of sittings, and, like the Methodists, are widely and generally diffused throughout the State; they have a college and numerous high schools. The Presbyterians rank as the third; they claim descent from the Scotch church; one college, a Theological Seminary and many high schools are under their control. The fourth in order is the Protestant Episcopal, the American form of the Church of England, which was in Colonial times the established church in Virginia; a college, a Theological Seminary and numerous high schools pertain to this church. The table gives the details of the other religious bodies; only it should be stated that the Lutherans and Roman Catholics have each a college, and that nearly every denomination has excellent preparatory and high schools fostered by it.

The next table gives the distribution of the 8 leading denominations, all that are given by the census of 1870, in the grand divisions of the State.

Table II.
Selected Statistics of Churches in Virginia in 1870.

	ALL DENOMINATIONS.				Methodist Episcopal.		Baptists.		Presbyterian.		Protestant Episcopal.		Christian.		Lutheran.		United Brethren.		German Reformed.	
	Organizations.	Edifices.	Sittings.	Property.	Organizations.	Sittings.	Organizations.	Sittings.	Organizations.	Sittings.	Organizations.	Sittings.	Organizations.	Sittings.	Organizations.	Sittings.	Organizations.	Sittings.	Organizations.	Sittings.
Tidewater.....	608	595	210,925	\$1,247,250	228	72,600	250	85,230	12	6,000	62	23,425	34	12,550	3	1,250	.....	.....	.....	.....
Middle.....	627	617	193,860	1,447,443	225	64,800	228	74,080	77	24,750	55	16,150	22	6,675	1	.....	.....	.....	.....	.....
Piedmont.....	462	427	117,999	690,175	163	41,757	177	42,142	33	10,950	44	11,550	11	2,300	6	1,650	.....	.....	3	400
Blue Ridge.....	77	60	17,618	24,200	39	6,650	33	9,118	2	800	.....	.....	.....	.....	2	700	.....	.....	.....	.....
Valley.....	544	485	147,935	971,150	137	45,485	103	31,330	64	22,320	21	8,153	25	5,950	62	18,650	37	7,050	21	5,500
Appalachia.....	261	221	68,770	152,150	168	39,345	58	14,960	16	5,175	3	800	8	1,450	6	3,100	1	400	.....	.....
Total.....	2,552	2,465	757,127	\$1,532,303	1,010	270,270	849	256,550	204	63,265	85	60,105	100	29,225	80	25,350	38	7,450	24	5,900

The Methodists and Baptists are found in all parts of the State, the Methodists predominating in the Valley and Appalachia, and the Baptists in the Tidewater and Middle divisions. The Presbyterians have their greatest strength in Middle, Piedmont and Valley, especially in the central part of Middle and in most parts of the Valley, excepting the central portion of the Shenandoah Valley, where the population is of German origin and where the German Reformed, Lutheran and United Brethren churches are found. Much of the Valley was settled by Scotch, and there the Presbyterian churches are most numerous.

The *Protestant Episcopal* church has its greatest numbers in Tidewater, Middle and Piedmont, the portions of the State first settled by Englishmen, and many of its church edifices are those that were erected in colonial times for the established church. This denomination generally has churches in all the larger towns of the State; the same is true of the Presbyterians. The other leading denominations are also found in these centres of population, but they also occupy every other portion of the field of Christian effort more thoroughly than these. The *Christian* denomination is somewhat Baptist in its peculiarities, but it is a distinct church; it is quite influential in Tidewater, Middle and Valley Virginia. The *Lutherans* are numerous in portions of the Valley, where the original population was of German origin; the *German Reformed* church is found in the same localities, as is also the *United Brethren* (which, from resemblances, may be called the German Methodist church). The *Roman Catholic* churches are found in the large towns and cities, as a general rule.

The Friends have a number of churches, mostly in the northeast part of the State and in Richmond. Jewish synagogues are found in the large cities.

The Constitution* of the State—the *supreme* law, Article V, Section 14—provides that “No man shall be compelled to frequent or support any religious worship, place or ministry whatsoever, nor shall any man be enforced, restrained, molested or burthened in his body or goods, or otherwise suffer, on account of his religious opinions or belief; but all men shall be free to profess, and by argument to maintain their opinions in matters of religion, and the same shall in no wise affect, diminish or enlarge their civil capacities. And the General Assembly shall not prescribe any religious test whatever or confer any peculiar privileges or advantages on any sect or denomination, or pass any law requiring or authorizing any religious society or the people of any district within this Commonwealth to levy on themselves or others any tax for the erection or repair of any house of public worship, or for the support of any church or ministry, but it shall be left free to every person to select his religious instructor, and to make for his support such private contract as he shall please.”

Article XI, Section 11, of the same constitution, secures to ecclesiastical bodies the right to all church property regularly conveyed to them.

Clause 18 of the Bill of Rights, a portion of the organic law, declares “That religion or the duty which we owe to our Creator, and the manner of discharging it, can be directed only by reason and conviction, not by force or violence; and, therefore, all men are equally entitled to the free exercise of religion according to the dictates of conscience; and that it is the mutual duty of all to practice Christian forbearance, love and charity towards each other.”

Thus it will be seen that *the State has nothing whatever to do with religious matters, except to see that every man is left entirely free to follow the dictates of his own conscience and to secure to religious bodies their rights in such property as they have properly obtained for church purposes.*

* Code of 1873, page 82.

CHAPTER IX.

PROVISION FOR EDUCATION.

Through public and private liberality the most ample provision is made in Virginia for the education, both primary and advanced, of all the children of her people; and it may be stated, as an established fact, that an education, be it the simplest or the fullest, is within the reach of any one in the State that has the desire and the mental capacity to obtain it.

There are in Virginia, as in all countries where the benefits of a thorough education are understood, two systems of schools, *public* and *private*; the first supervised and provided for, wholly or in part, by the State; the second controlled and sustained by private enterprise, acting in individual or corporate capacity.

SECTION I.

THE PUBLIC SCHOOL SYSTEM of Virginia provides for instruction—

1st. *Primary*, in Public Free Schools.

2nd. *Intermediate*, in Graded and High Schools, which are also free.

3rd. *Advanced*, in the Military Institute, the Agricultural and Mechanical College and the Normal and Agricultural Institute.

4th. *Higher*, in the University of Virginia, with its literary, scientific, technical and professional schools.

In all these provision is made for the free, or comparatively free, instruction of the whole or of a portion of the youth of the Commonwealth.

PRIMARY AND INTERMEDIATE INSTRUCTION.

The* Public Free School System of the State, that has for its object the primary and intermediate instruction, *free* of direct charge, of all persons residing in the State between the ages of 5 and 21, completed the fifth year of its existence on the 1st of September, 1875, and it is conceded, by those most capable of judging, that it is one of the best managed and most efficient, all things considered, in this country of public free schools.

Organization.—The system is in charge of a Board of Education, composed of the Governor of the State, the Attorney General and the Superintendent of Public Instruction, the latter being the Executive officer of the System.

* In this educational summary free use is made of the able and exhaustive annual reports of Dr. Ruffner, the State Superintendent of Public Instruction.

The 99 counties of the State form 87* divisions, each having a county Superintendent of Schools, who has the general charge of the system for his county; there are also 6 cities that have Superintendents of Schools.

The counties of the State are subdivided into townships, some 454 in number, each of which constitutes a School District, and has a Board of three Trustees, charged with the local control of the system and its property, under the supervision of the County Superintendent.

It is evident that ample provision is here made for thorough supervision and at moderate expense, as only the Superintendents are salaried. The Trustees provide the place and name the teacher; the County Superintendent examines, and, if found capable, commissions the teacher; and then sees that his duties are properly discharged.

The only requisite for admission to the schools is the proper age and that the father, if alive and resident in the school district, and not a pauper, shall have paid the capitation tax, about one dollar, for the current year, this tax going to the school fund.

The *system is supported by*—1st, a capitation tax on every male citizen 21 years old and over, that may not exceed one dollar per capita; 2d, the annual interest of a fund belonging to the State, and known as the Literary Fund; 3d, an annual tax, on all the property in the State, that may not be less than 1-10th or more than $\frac{1}{2}$ of one per cent.; and, 4th, any school district may levy an additional tax, but no tax to exceed $\frac{1}{2}$ of one per cent. in a year.

The Results of the Free School System.

The following condensed table, showing the condition of the system for each of the five years that it has been in operation, gives a good idea of what is here done for primary and intermediate education:

	1871.	1872.	1873.	1874.	1875.*
Number of public schools.....	3,047	3,695	3,696	3,902	4,185*
Number of graded schools.....	0	107	123	155	155
Number of pupils enrolled.....	131,088	166,377	160,859	173,875	184,486
Pupils in average daily attendance.....	75,722	95,488	91,175	98,557	103,927
Percentage of school population enrolled.....	31.8	40.5	37.9	39.8	38.2
Percentage of school population in average daily attendance..	18.8	23.2	21.5	22.6	21.5
Number of teachers employed in public schools.....	3,084	3,853	3,757	3,962	4,262
Number of school-houses owned by districts.....	190	504	764	1,034	1,256
Value of public school property.....	\$211,166	\$389,380	\$524,638	\$682,500	\$757,181
Average number of months schools in session.....	4.66	5.72	5.22	5.40	5.59
Cost of tuition per month per enrolled pupil.....	\$ 0.74	\$ 0.70	\$ 0.75	\$ 0.74	\$ 0.70
Average monthly salary of teachers.....	\$29.86	\$29.81	\$32.00	\$32.64	\$30.48
Whole cost of public education for current expenses.....	\$557,472	\$816,812	\$814,494	\$873,145	\$924,113

* Two counties in some cases having but one Superintendent.

School Population.—The school population embraces all persons between five and twenty-one years of age, and all these may attend the schools if they desire to. In 1872 the average age of those that actually attended was from 10 to 13.

School population of Virginia, 1873:

White	{ Males..... 128,967 }	..... 353,411
	{ Females 124,444 }	
Colored.....	{ Males..... 87,399 }	..... 170,696
	{ Females 83,297 }	
Aggregate		424,107

The table before given shows that 160,859 of these were enrolled for attendance—that is, indicated that they would attend, and did so, probably, with more or less regularity, they formed 37.9 per cent. of the school population; a large proportion when the ages it includes are regarded: 91,175 were in average attendance during the 5.22 months of the session for the year, or 21.5 per cent. of the school population; largely over one-fifth, showing that good use is made of the advantages so freely offered.

The school population of 1875* was:

White	289,149 }	..... 482,789.
Colored.....	202,640 }	

The preceding table furnishes the details of enrollment, &c.

The public schools of Virginia have derived much advantage from assistance rendered from the "Peabody Education Fund," through its able, efficient and sympathetic General Agent, Dr. Barnas Sears, who, in his annual report to the Trustees of that fund, in 1875, says, "The Public Schools of Virginia are constantly improving in character and increasing in number. The attendance is about ten thousand greater than it was last year. In a short time it may be expected that all the smaller and more remote country districts will feel their beneficent influence. The system of public instruction seems to be well grounded in the general sentiment of the people."

In 1875 there was contributed to Public Education in Virginia from the Peabody Education Fund \$23,750, in aid of graded schools, teachers' institutes, and the Virginia Educational Journal.

*In 1875 there were in Virginia 99 counties, 6 cities of the first class and 4 of the second; 89 county and 8 city superintendents of schools, 458 school districts, 1,371 school trustees, and 444 school district boards. The white public schools were 3,121 in number, and the colored 1,064. In cities the schools were taught 9.69 and in the country 5.42 months, on an average, during the year. The enrolled pupils were 129,545 white and 54,941 colored. There were 74,056 white and 29,871 colored pupils in average daily attendance. Of the school population, 46.2 per cent. of the white and 27.1 per cent. of the colored were enrolled. The average cost of tuition was 70 cents. currency, a month to the enrolled pupil. The teachers were 3,723 white (2,360 males and 1,363 females), and 539 colored (351 males and 188 females).

The *private schools* of the State were attended by 23,285 pupils (19,133 white and 3,819 colored), taught by 1,229 white (454 males and 775 females), and 99 colored (33 males and 57 females) teachers.

There were in the colleges of the State 1,839 white students.

The entire school attendance in Virginia in 1875 was 207,771 pupils (149,011 white and 58,760 colored), or about 16 per cent. of the population.

The following table presents the statistics of the Public free schools for the year ending August 31st, 1872, for the grand divisions of the State:

SCHOOL POPULATION BETWEEN 6 AND 21 YEARS OLD.										SCHOOLS.				TEACHERS.												
NUMBER OF COUNTIES & CITIES.																										
	WHITE.					COLORED.					TOTAL WHITE AND COLORED.	White.	Colored.	Total.	Average months taught.	WHITE.			COLORED.			Average white and colored.	From all sources.			Total from public funds.
	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.	Male.						Female.	Total.									
Tidewater	33	28,644	17,062	49,815	27,823	37,035	55,865	109,497	487	260	747	6.00	422	223	664	71	52	123	787	32.13	23.33	29.45	29.07			
Middle.....	28	25,147	24,495	55,671	30,836	28,770	50,213	113,396	565	313	807	5.77	521	378	893	49	35	84	975	34.76	26.72	30.67	27.39			
Piedmont.....	14	21,460	19,868	41,364	14,174	13,631	28,599	61,199	470	188	638	5.51	436	172	608	36	14	49	637	30.32	26.76	29.13	28.08			
Blue Ridge.....	3	5,541	5,241	10,782	413	383	796	11,578	128	6	134	5.56	116	21	137	4	.....	4	141	22.57	20.77	22.41	19.81		
Valley	15	29,248	27,555	54,764	5,368	6,323	13,094	69,868	833	91	818	5.27	607	210	816	52	33	83	873	32.97	32.24	31.78	26.80			
Appalachia.....	12	14,909	13,885	26,834	1,417	1,265	3,792	31,626	355	15	370	4.40	314	46	360	11	1	12	372	27.71	24.64	27.59	23.88			
	105	.....	.....	247,002	.....	.....	164,019	411,021	2,788	907	3,695	5.72	2,346	1,147	3,493	224	136	360	3,863	\$30.58	\$28.26	\$29.81	.....		

Totally distinct and separate schools are provided for the white and for the colored children; the law requires that that they shall not be mixed.

What is Taught.—In all the primary schools are taught orthography, reading, writing, arithmetic, geography and English grammar; in some, other branches are also learned. In the *graded schools* provision is made for *intermediate* instruction, the pupil being advanced from grade to grade upon examinations; and in the higher grades are taught the sciences, languages, &c., &c., furnishing a preparation for college or university.

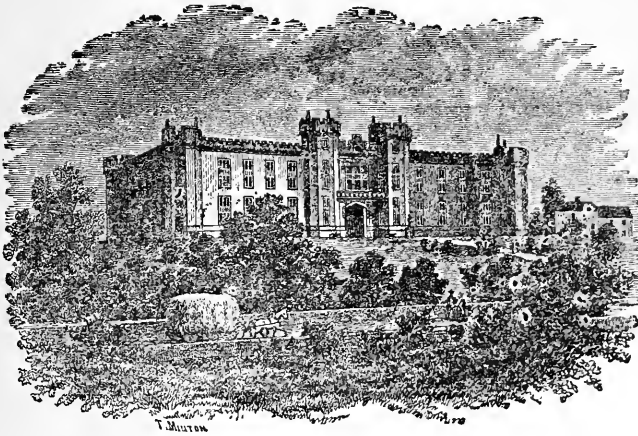
In 1872 there were 106 graded schools in operation, and in 1873 the number was 123, showing that the tendency is to improve the character of the schools.

The report for 1873 gives the following facts in regard to the *school houses* and *aids to instruction*, viz:

Of the 3,421 in use, 1,914 were built of logs (the usual comfortable pioneer building material in America); 1,329 were frame, 143 were brick, and 28 were of stone; 2,732 had grounds attached, 1,287 had good furniture, 167 were provided with wall maps, 85 with globes, 106 with reading charts, 95 with arithmetical charts, and 2,180 with black boards; 315 new school houses were built during the year. It is evident that the day is not distant when there will be in every neighborhood a well taught and well provided public free school. In fact the Constitution of the State provides that "a uniform system of public free schools" shall be fully introduced into all the counties of the State "by the year 1876 or as much earlier as practicable." It is proper to add that these schools are greatly assisted by donations from the "Peabody Education Fund," and also that they are patronized by all classes of citizens.

Advanced Instruction.

The VIRGINIA MILITARY INSTITUTE, located at Lexington, Rockbridge County, in the Great Valley, has completed the 34th year of its existence, and deservedly stands at the head of the State Institutions for *advanced* instruction. This is a



THE VIRGINIA MILITARY INSTITUTE, LEXINGTON, VA.

military and *scientific* school of a high grade, with the following Departments: (1) Mathematics; (2) Latin Language and English Literature; (3) Practical Engineering, Architecture and Drawing; (4) Animal and Vegetable Physiology, applied to Agriculture; (5) Infantry, Cavalry and Artillery Tactics, Military History and Strategy; (6) Natural and Experimental Philosophy; (7) Civil and Military Engineering and Applied Mechanics; (8) Practical Astronomy, Physics, Descriptive Geography and Geodesy; (9) Mineralogy, Geology and Metallurgy. These departments are in charge of 18 or more professors and assistants, with all needful appliances for illustration, &c. The organization is *strictly military*, the students are *cadets*, uniformed, divided into companies, officered, and drilled in the use of arms;

they perform all the duties of a soldier in camp, and are at all times subject to military laws and regulations; the professors are officers.

The Institute has proven itself a most valuable training school for army officers, and many of its graduates were distinguished during the late Confederate war; but it is as a *school of general and applied science* that it has a distinct place in the educational system of the State; it educates the civil and mining engineers, chemists, &c.—the skilled directors of practical industry.

Though a State institution, the Institute is open to all, and in 1872 the 139 students of Virginia met there 173 from other States, the very flower of their youth attracted by its reputation for discipline and training for active and professional life.

The Institute receives an annuity from the State, and in return furnishes *board and instruction, without charge*, annually to fifty young men, between the ages of 16 and 25, selected from every part of the Commonwealth. The State requires that these young men shall, after leaving the Institute, teach for not less than two years in the State: in this way it becomes an essential part of the public school system, giving advanced instruction and furnishing teachers of a high grade. The cost per year for a pay cadet is about \$350.

THE VIRGINIA AGRICULTURAL AND MECHANICAL COLLEGE is located at Blacksburg, Montgomery county, in the southwest of the Great Valley. This is a new institution, opened for the first time in October, 1872, with five instructors and 132 students;* it is endowed by a donation of public lands from the General Government, and is designed as a school for the *advanced* training of the "industrial classes"—for those that "*handle tools*."

The course of instruction is as follows:

I. A *Literary Department*, in which are taught the English Language and Literature, the Ancient and the Modern Languages, and Moral Philosophy.

II. A *Scientific Department*, in which Mathematics, Natural Philosophy, Chemistry, Mineralogy, Geology, Botany and Zoology are taught.

III. A *Technical Department*, for Agriculture and Mechanics.

The study of Ancient Languages is not obligatory; French or German is; the Moral Philosophy course is a short one; in the other subjects named the instruction is intended to be thorough and adapted to the wants of the trained and skilled agriculturist and machinist. The degrees conferred, upon examinations, are Graduate in Agriculture, or in Mechanics.

A farm of 245 acres is attached to this college, and on it practical instruction is given in Agriculture, and students have an opportunity for engaging in remunerative manual labor. Provision is also made for practical mechanical training. Military drill is also required, and to promote efficiency in this the students dress in uniform.

This institution, as part of the school system of the State, educates without charge for tuition, use of rooms, laboratories, &c., a number of students equal to the number of the members of the House of Delegates (138 at this time), selected by the school trustees of counties, &c. (the districts of the Delegates), "with reference to the highest proficiency and good character," "from the white male students

* 197 the next year, and 222 the third.

of the free schools," or others if the trustees elect. The expenses of these "State students," including uniform, are from \$100 to \$150 for the school year, which (owing to the character of the school) embraces all the year, except two months from Christmas. The expenses of a "pay student" are \$45 more for the session.

The course of study adopted is intended for three years, and during all that time farm and work-shop labor of a certain amount are required.

The HAMPTON NORMAL AND AGRICULTURAL INSTITUTE is located at Hampton, in Elizabeth City county, in the Tidewater country, and is designed, as its charter states, "For the instruction of youth in the various common school, academic and collegiate branches, the best methods of teaching the same, and the best mode of practical industry in its application to agriculture and the mechanic arts."

This Institute is for the exclusive benefit and use of the colored people of the State, and subserves a most important end in providing an advanced education and industrial training for this large class of the population of the State, which furnishes so much of its manual labor. One-third of the proceeds of the land donated to the State for agricultural colleges was given to this school, and in return it annually receives, free of charge for tuition, rooms, &c., 100 colored youths, selected for intelligence and character, from the free schools of the State.

A large farm is attached to this school, and it has shops of several kinds and a printing office, where the pupils are trained to labor, and at the same time they contribute largely to their own support.

This school is most ably and successfully managed, and is furnishing a large number of good teachers to the colored schools of the State.

It now has over 100 of the colored youth, of both sexes, of Virginia under its care. The system followed gives four days of school and two of labor in each week to the student.

The enrollment of students in 1874-'5 was 245—all between 14 and 25 years of age, one-third females; Virginia sent 144 that were educated free of charge for tuition and worked out half of their personal expenses. The total charge for every thing but books and clothing is \$10 a month. The students earned in the session \$6,750, at from 5 to 10 cents an hour, for work on the farm, in shops, &c. The expenses per scholar for the year averaged \$105.

The UNIVERSITY OF VIRGINIA is the worthy head of the State system of public instruction and supplies, in the fullest and best manner, the means for obtaining the *Higher Education*.

This institution, now in the fiftieth year of its existence, holding a foremost place among the Universities of America, is located near Charlottesville, Albemarle county, in the lovely Piedmont section of the State.

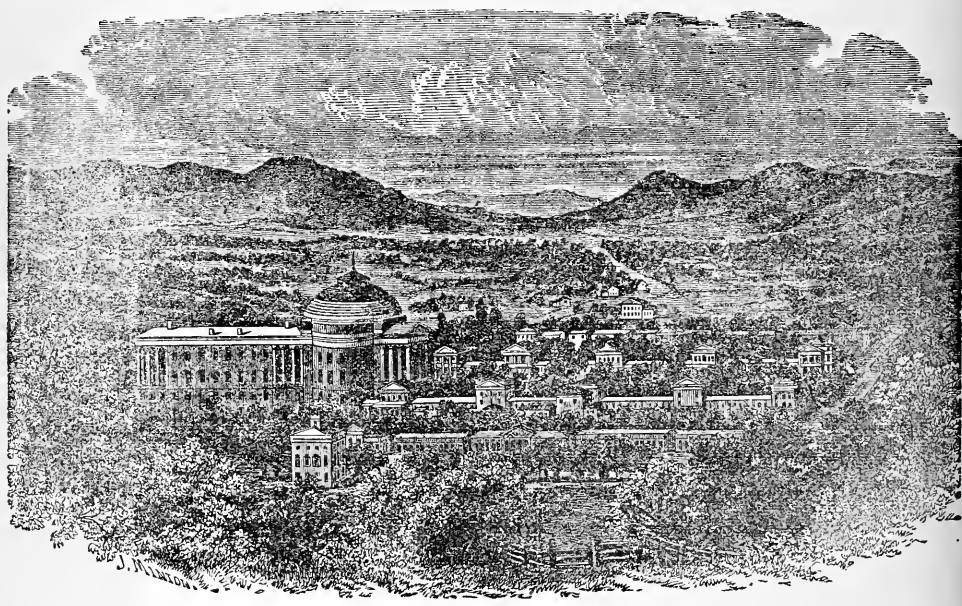
The system of instruction is by *independent schools* for all the chief branches of human learning, leaving the student free to select and attend such as are suited to his tastes or adapted to his proposed pursuits in life. This *elective system*, inaugurated,* at the opening of this University, for the first time in America, has been so fruitful in results that all the leading institutions of the country are now adopting it. It seems superfluous to dilate upon the wisdom of a plan of teaching that en-

*By Thomas Jefferson.

ables each one to perfect himself in that he is best fitted for, gives him credit and honors for his success, and does not clog his course with studies that "edify not."

The *independent schools* of the University now in operation are—

I. In the *Literary and Scientific Department*: (1) Latin; (2) Greek; (3) Modern Languages; (4) Moral Philosophy; (5) History, General Literature and Rhetoric; (6) Mathematics; (7) Natural Philosophy; (8) General and Applied Chemistry; (9) Applied Mathematics, Engineering and Architecture; (10) Analytical and Agricultural Chemistry; (11) Natural History, Experimental and Practical Agriculture. II. The *Medical Department*: with schools (1) of Medicine; (2) of Physiology and Surgery; (3) of Anatomy, &c. III. The *Law Department*: with schools (1) of International and Constitutional Law; (2) of Statute and Common Law. And, IV. The *Agricultural Department*. Each has the sub-division into such schools as are demanded by the nature and present development of the subject.



UNIVERSITY OF VIRGINIA,* CHARLOTTESVILLE, VA.

Each of these schools is in charge of an able professor, who, with his assistants, instructs by lectures, text-books and daily examinations.

The University confers no honorary degrees but to those that prove by examinations, generally in writing, that they understand not only the general principles, but also the details of the subjects taught in the *schools*, or in any school, and *to such only* are awarded its honors and certificates of scholarship—*attainments*, not time or a round of studies, are considered. It results from this high standard of requirements that the certificates of the University of Virginia are everywhere accepted as evidences of substantial acquirements, and their possession opens the way to position and influence for their possessor.

The academic degrees conferred at the University are: (1) *Proficient*, (2) *Grad-*

*Copied by permission from Scribner's Magazine, New York.

uate in a school, (3) *Bachelor of Letters*, (4) *Bachelor of Science*, (5) *Bachelor of Arts*, and (6) *Master of Arts*; the professional degrees are: *Bachelor of Law*, *Doctor of Medicine*, *Civil Engineer*, *Mining Engineer*, and *Civil and Mining Engineer*.

The session is a continuous one of nine months—from October to July—and the expenses for the session are:

For Academic students from	-	-	-	-	\$261 to \$351
For Law students from	-	-	-	-	\$266 to \$356
For Engineering students from	-	-	-	-	\$276 to \$366
For Medical students from	-	-	-	-	\$296 to \$386

As part of the system of public instruction in Virginia, the University draws an annuity from the State, and in return it educates, *without payment of matriculation or tuition fees or rent*, forty "meritorious young men of limited means," one from each senatorial district, for two years, the State requiring that these young men shall teach in some public or private school in Virginia for two years after leaving the University, the emoluments of such service enuring to their own benefit. This "aid" is worth from \$120 to \$150, and reduces the cost of attending the University to that extent. The University has some thirteen scholarships, open to all by competitive examinations, and it extends a credit of three years after leaving to any worthy students not able to pay on entering; no tuition fees are charged to needy young men, of any religious denomination, preparing for the ministry. Thus it is seen that provision is made by which the benefits of this great University, with all its extensive appliances for educational purposes, are placed within the reach of the humblest.

As this is a State institution, where there is no State church, there is here no established form of worship, but, by common consent, each of the four leading denominations in the State—Methodists, Baptists, Presbyterians and Episcopalians—in rotation, sends a chaplain to the University for a term of two years, who daily conducts worship in the chapel, at set times, which the students are free to attend if they think proper—there are no requirements made. Results show that in no institution is there a higher standard of Christian morality or more church members among the students in proportion to numbers.

The number of students for the session of 1872-'3 was 342, of whom 157 were from Virginia and the others from 22 different states; the number of instructors was 21. The number for 1873-'4 was 353, and for 1874-'5, 373. The graduates of the Law School can practice in any of the courts of the State without further license.

The general control of the University is confided to a Board of nine Visitors, appointed by the Governor of the State, serving 4 years—3 from Piedmont, 2 from Tidewater, 2 from the Valley and 2 from Appalachia. The Board elects one of its number Rector.

This is but a meagre outline of the plan and work of this great and in all respects amply provided University—the worthy and cherished head of Virginia's Educational System, and (in the language of its Board of Visitors for 1873-'4) "the Normal School of the South—the Educator of Southern Educators."

By a recent (1876) act of the General Assembly the State has granted an annuity to the University, "on condition that the said institution during its continuance shall educate all students of the State of Virginia over the age of eighteen who shall be matriculated under rules and regulations prescribed by the Board of Visitors, without charge for tuition in the academic* department." * * "Provided, that no person shall be admitted as a student free of charge for tuition fees, under the provisions of this act, unless the faculty shall be satisfied, by actual examination of the applicant or by a certificate of some college or preparatory school, that he has made such proficiency in the branches of study which he proposes to pursue as will enable him to avail himself of the advantages afforded by the University." The effect of this is to open the doors of the University, without fee for tuition, to every young man in the State, because the free high schools furnish the requisite preparatory education.

A recent writer,† speaking of this institution, says: "Jefferson planned the University, and it still retains the characteristics which he gave it. In the departments of languages, literature, science, law, medicine, agriculture, and engineering, it has to-day 18 distinct schools. For more than half a century it has been pre-eminent among the higher institutions of learning in the country, and Northern colleges and universities have borrowed from it the feature of an elective system of study. It has laterally established excellent agricultural and scientific schools, has a fine laboratory, with an extensive collection of raw and manufactured materials, and an experimental farm inferior to none in the country. The institution bestows no honorary degrees, and makes the attainment of its 'Master of Arts' so difficult, that it will serve as a certificate of scholarship anywhere. Nearly one hundred and fifty of the graduates of the several schools are now professors in other colleges. The University is by no means aristocratic in its tendencies; a large proportion of the students pay their expenses with money earned by themselves, and, since the war, there have been many 'State students' who are provided with gratuitous instruction. The alumni form an army fourteen thousand strong."

The Virginia *Institution for the Deaf, the Dumb and the Blind* is located at Staunton, Augusta county, in the middle of the Valley, and makes ample provision for the education of these unfortunates of her population. This educational and industrial school has been in successful operation for 33 years and is second to none in the country in its efficiency.

The 47 boys and 42 girls in the Deaf-mute department in 1873 were taught the ordinary English Branches, with history, moral science, drawing and painting and the use of the "sign" language. The 26 boys and 10 girls of the blind department were taught the higher mathematics, natural sciences, French and vocal and instrumental music, in addition to the English Branches, history, &c. The boys are trained in shoe, cabinet, chair, mattress, broom and mat-making; in carpentry, tailoring, printing and book-binding. The girls are taught sewing, knitting, fancy work, &c., and make clothes, bind shoes, &c. The course of training occupies six years, and the entire charge a year, for everything but clothing, is \$200 for those able to pay, but everything is free to the indigent mute and blind children of the State.

* This includes all the schools of the Literary and Scientific Department, except (9) and (10), as before enumerated. † Edward King, of New York, in "The Great South."

The following table presents, in a condensed form, the Statistics in the State Institutions of Learning of Advanced and Higher Grades for the year ending August 31st, 1872:

NAME.	LOCATION.	No. of Instructors.	STUDENTS.			Tuition per session.	Board per month.	State Students.	Volumes in library.	When organized.	Session begins.	Months of session each year.
			From Virginia.	From other States.	Total.							
University of Virginia.....	Piedmont.....	21	165	200	365	\$75	\$15	440	35,000	1825	October.	9
Virginia Military Institute.....	Valley.....	28	139	173	312	100	15	50	4,000	1839	Septem'r	10
*Virginia Agricultural and Mechanical College.....	Valley.....	6	132	.....	132	40	10	4138	.....	1872	August.	10
† Hampton Normal and Agricultural Institute.....	Tidewater.....	10	(?)133	.....	133	.....	8	100	1,200	1863	Septem'r	9
‡ Deaf, Dumb and Blind Institution.....	Valley.....	11	113	7	125	2	.....	.....	1,500	1839	Septem'r	10
§ Emory and Henry College.....	Valley.....	5	36	147	183	60	13	16	4,550	1838	Septem'r	10
Total.....		81	723	527	1,250			344	46,550			

It will be seen by the above that the State has 344 scholarships in its gift in these higher institutions of learning. The table itself is suggestive. Virginia is the centre of higher education for the Southern and Southwestern states of the Union especially, but it attracts students from all directions.

* For 1873—not organized in 1872. † As many as there are senatorial districts. ‡ As many as there are members of House of Delegates. § \$200 covers all expenses; to the indigent, free. || Given here, though not a State institution, because it teaches 16 for the State without charge.

¶ This institution is not properly classified; it does not claim the position here given it.

SECTION II.—THE PRIVATE AND CORPORATE SCHOOL SYSTEM OF VIRGINIA.

Like the public school system just treated of, this has—

- 1st. *Primary*—private, church, and endowed schools;
- 2nd. *Intermediate*—private, church, and endowed high schools;
- 3rd. *Advanced*—private, church, and endowed colleges, &c.;
- 4th. *Higher*—in endowed University and Professional schools.

There were in operation in the State, for the educational year 1871-'72, some 647 *primary schools* of this kind, 610 for white and 37 for colored children, attended by 8,884 whites and 1,476 blacks—10,320 in all, having an average length of session of 6.75 months, at an average charge of \$1.90 per month for tuition. The number of teachers engaged was 715. Some of these schools belong to the different churches, but most of them are private enterprises. The schools are well conducted. It is likely that as the public free school system becomes general the number of these will be reduced.

The schools of this State for *Intermediate Instruction* are of a very high order, many of them comparing favorably, in all respects, with institutions that elsewhere rank as colleges.

The number of high schools in the State (and they are found in every portion of it) in 1871-'2 was 181, with 574 teachers and 7,491 pupils; the average length of the sessions was 8.33 months, and the rate of tuition averaged \$4.91 per month.

The high schools for boys, most of them the result of private enterprise (although there are some endowed academies), will compare, as preparatory schools for College and University, most favorably with those of any country in the character and number of their teachers, their courses of study and the efficiency of their training. Some of these are boarding schools, kept at the country homes of the principals; others are day schools, in the larger villages and towns.

Some of these schools deserve special mention; no doubt some omitted are equally as worthy.

In Albemarle county are the *Verulam* and *Brookland* schools and the *Charlottesville Institute*; in Alexandria, *St. John's* and *Alexandria and Potomac* academies; in Bedford, the *Bellevue High School*; in Culpeper, the *Virginia High School*; in Augusta, the *Staunton Academy*; in Fairfax, the *Episcopal High School*; in Fauquier, the *Clifton* school and *Piedmont* and *Bethel* academies; in Frederick, the *Shenandoah Valley Academy*; in Hanover, the *Hanover Academy*; in Loudoun, *Leesburg Academy*; in Louisa, *Aspen Hall Academy*; in Madison, *Locust Dale Academy*; in Nelson, *Norwood College* and *Elmington Classical and Military School*; the *Norfolk Academy*, at Norfolk; *University School*, at Petersburg; the *University School*, *Richmond Male Academy*, *Shockoe Hill Academy*, *German High School*, and a half dozen others known by the names of their principals, at Richmond; *Fancy Hill Academy* and *Lexington Academy*, in Rockbridge county; *Fredericksburg Academy*, in Fredericksburg; the *Goodson* and *Abingdon* academies, in Washington county. In every portion of the State are academies and high schools, taught by graduates of the Universities, Colleges or Military Institute, in which boys are prepared for college. Many boys from other states attend these schools.

Female Collegiate education has been most amply provided for in Virginia by private and denominational schools. The numerous female colleges in the State are not only organized on nearly the same plans as the universities and colleges for males, but they are as liberally patronized from other states.

Of denominational female high schools that, in their buildings, courses of study, number and character of teachers, &c., deserve to rank as colleges, the following may be named (1871-'2):

The Presbyterians have five: the *Augusta Female Seminary*, at Staunton; *Ann Smith Academy*, at Lexington; *Stonewall Jackson Institute*, at Abingdon; *Leavenworth Seminary*, at Petersburg, and *Southside Institute*, at Danville.

The Baptists have three: the *Hollins Institute*, in Roanoke county; *Richmond Female College*, at Richmond, and *Roanoke Female College*, at Danville.

The Episcopalians have four: the *Virginia Female Institute*, at Staunton; the *Southern Female Institute*, at Richmond; the *Piedmont Female Institute*, at Charlottesville, and *St. Paul's Church School*, at Petersburg.

The Lutherans have the *Staunton Female Seminary*, at Staunton.

The Roman Catholics have three: *Monte Maria Academy* and *St. Joseph's Asylum*, at Richmond, and *St. Mary's Academy*, at Alexandria.

The Christians have a *Collegiate Institute* at Suffolk.

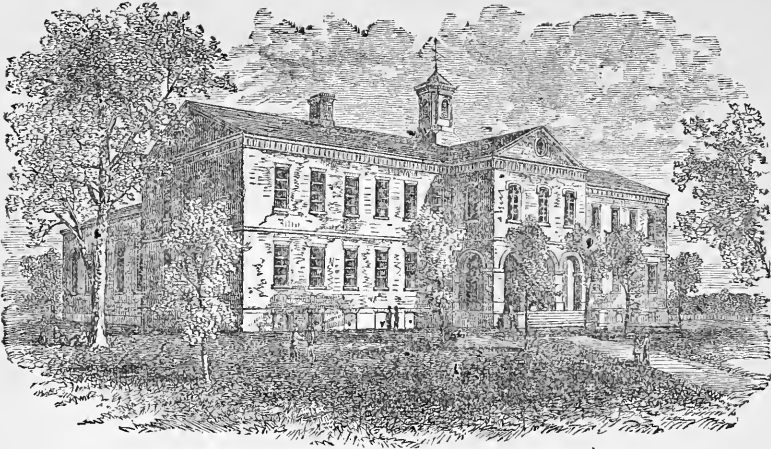
The Methodist Episcopal Church South has four: the *Wesleyan Female Institute*, at Staunton; *Martha Washington College*, at Abingdon; *Mountain View Seminary*, at Bristol, and *Danville Female College*, at Danville.

These 21 large and flourishing schools, situated in all parts of the State, most of them with large buildings, apparatus, &c., and with numerous teachers, provide fully for higher female education. Besides these, there are hundreds of smaller and more private female schools in the numerous villages, towns and cities of the State, many of them conducted by ladies of refined taste and cultivation.

THE COLLEGES for *advanced instruction* are all excellent institutions, well provided with buildings, apparatus and able professors; many of them are well endowed, and all offer special advantages to those in need of aid in obtaining a collegiate education.

The Superintendent of Public Instruction says, in his Report for 1872: "The denominational character of several of our colleges is no objection whatever. It is a blessed fact that all our higher institutions are earnestly Christian without any of them being narrow in their spirit. High culture is liberalizing in religion as in everything else. It is both natural and proper that the Christian people of the several denominations should establish and maintain colleges where the special influence shall be in harmony with their own religious sentiments."

WILLIAM AND MARY COLLEGE, at Williamsburg, James City county, under Protestant Episcopal influence, is the oldest collegiate institution in Virginia, dating from the time of England's sovereigns, William and Mary, who contributed to its endowment, and were honored by having it named for them. This is especially the college of the Tidewater Region. It stands high as a training school; its roll of alumni includes many of the most noted Americans of the last 180 years.



WILLIAM AND MARY COLLEGE, WILLIAMSBURG, VA.*

HAMPDEN SIDNEY COLLEGE, in Prince Edward county, Middle Virginia, a Presbyterian seat of learning, next in age, enjoys a high reputation as a training school for professional studies and business life. Its system is that of a curriculum: it has a President, who is professor of Moral Science, and Professors of Natural Science, of Latin and German, of Greek and French, and of Mathematics. This college is situated in the country, away from any town.

EMORY AND HENRY COLLEGE, a Methodist Episcopal institution, in Washington county, in the southwestern part of the Great Valley, is one of the two very flourishing colleges belonging to that leading denomination. This institution adheres to the curriculum method of training, and has the usual number of chairs found in all well conducted colleges. This institution receives annually, selected from all portions of the State, sixteen young men (not able to incur the expenses of a collegiate course) without charge for tuition, board or lodging, in return for a grant made it by the State; these young men are required to teach the same as the State students of the University or Military Institute.

RANDOLPH MACON COLLEGE, at Ashland, Hanover county (not far from Richmond city), is the other college under the care of the Methodist Episcopal church. The course of study is *elective*, and it has schools of Latin, Greek, English, French, German, Pure Mathematics, Applied Mathematics, Natural Science, Chemistry, Physiology and Hygiene, Moral Philosophy and Metaphysics, Biblical Literature and Oriental Languages; it also has a preparatory or introductory course in charge of the professors. This is a very flourishing and popular institution.

RICHMOND COLLEGE, at Richmond city, belongs to the Baptists. By the zeal and liberality of its friends, this institution has been most liberally provided for and placed in the front rank among Virginia colleges. Its organization is into eight independent, academic schools and a Law school—making its system an *elective* one, modeled after that of the University of Virginia. Its *schools* are: Greek, Latin, Modern Languages, English, Mathematics, Mechanics, Chemistry, Philosophy and Law. The student can, upon examination, graduate in any school or obtain the usual degrees by graduating in a required number of schools.

* Copied by permission from Scribner's Magazine, New York.

ROANOKE COLLEGE is a Lutheran institution, located at Salem, Roanoke county, in one of the most attractive portions of the Valley. Though one of the youngest colleges, it is one of the most flourishing. Its system is the regular college curriculum, its students being divided into Freshman, Sophomore, Junior and Senior classes for a four years' course of study; it has also a Normal course for teachers of public schools—a select one for a mere business education, and a Preparatory Department for training boys for the college classes.

ST. JOHN'S COLLEGE, at Norfolk, is a lately established Roman Catholic college, with a full corps of Professors.

THE UNION THEOLOGICAL SEMINARY, near Hampden Sidney college, is the divinity school of the Presbyterians. It is a well endowed and ably conducted professional school.

THE PROTESTANT EPISCOPAL THEOLOGICAL SEMINARY, near Alexandria, is the flourishing and well ordered divinity school for training the clergy of the Episcopal church.

COLVER INSTITUTE, in Richmond, is a theological school belonging to the colored Baptists.

THE VIRGINIA MEDICAL COLLEGE, at Richmond, is an excellent school of medicine, with two courses of lectures each year, and the usual professors found in well conducted institutions of its kind. It has a hospital attached, where its students are familiarized with the diseases of the country.

THE POLYTECHNIC SCHOOL, at New Market, in the noted Shenandoah Valley, is a recently organized high school, with an advanced scientific course, designed for training farmers, mechanics, &c. It is quite flourishing.

THE COMMERCIAL COLLEGE, the OLD DOMINION BUSINESS COLLEGE, the SCHOOL OF TELEGRAPHY, and the NORMAL SCHOOL, at Richmond, offer facilities for special training for accountants, telegraph operators, &c.

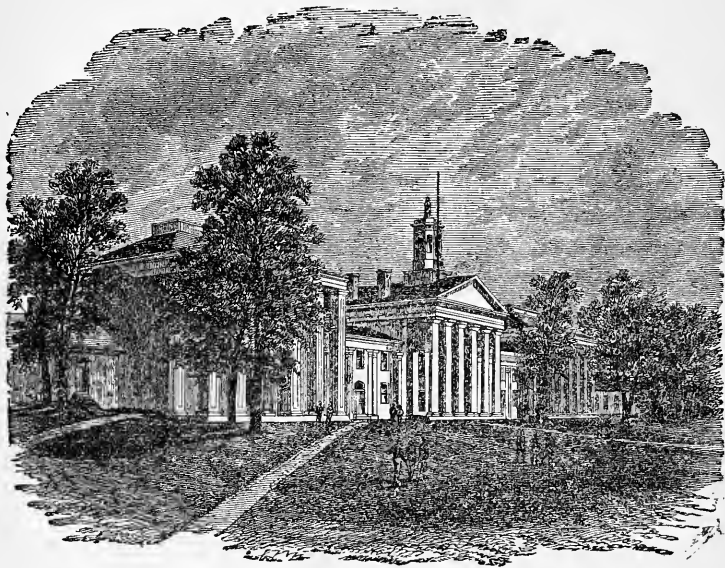
There is also a *colored* NORMAL SCHOOL at Richmond; for *in no educational arrangements of any kind whatsoever, in Virginia, are the two races mixed or even sent to the same institutions.* Unless mention has been made to the contrary, all the institutions that have been spoken of are for white persons *exclusively*; full provision is made for the colored people, but, *in all cases*, it is for them alone.

WASHINGTON AND LEE UNIVERSITY, located at Lexington, in Rockbridge county, in the heart of the Great Valley, stands at the head of the institutions for *Higher Culture* as fostered and developed by private and corporate liberality and enterprise. *It is not denominational or sectarian* in its character, but is controlled by a self-perpetuating Board of Trustees, composed of eminent and worthy citizens.

The plan of *independent schools* is followed, as at the University of Virginia—in fact, the organization, courses of study, &c., are much the same at these two great institutions of higher learning.

The schools are (1873): (1) Latin, with three classes; (2) Greek, with three classes; (3) Modern Languages, with two classes in both French and German; (4) English Language and Literature, with two classes; (5) Moral Philosophy, with two classes; (6) History and Political Economy, with two classes; (7) Mathematics, with three classes; (8) Applied Mathematics, with the division into Civil and Military Engineering and Astronomy, with three classes in Engineering and two in

Astronomy; (9) Natural Philosophy, with three sections and three courses; (10) Chemistry, Mineralogy and Geology; (11) Applied Chemistry, with two courses. The *Courses of Civil and Mining Engineering* extend over three years, and include a number of the *schools* just named; the *Course of Agriculture* extends over two years, and includes a number of the *classes* of the *schools*. The *Department of Law and Equity* includes (1) the School of Common and Statute Law, and (2) the School of Equity and Public Law, each with two classes.



WASHINGTON AND LEE UNIVERSITY, LEXINGTON, VA.*

There is also a *Business* school, and arrangements are being made for a distinct course of *Commerce* and one of *Mechanical Engineering*.

Students are graduated and degrees conferred as in the University of Virginia, as before stated.

The necessary expenses for the yearly session of nine months are from \$230 to \$300. This University offers a number of free scholarships, as prizes, to the most distinguished pupils of the high schools of Virginia; it aids young men by a credit of a number of years after completing their studies; it gives free tuition, when asked, to all young men studying for the Christian ministry; it grants special privileges to those intending to teach or to follow the profession of journalism; it offers a post-graduate course, with substantial emoluments, to its most distinguished graduates.

During the session of 1872-'3, Washington and Lee had 263 students—81 from Virginia and 182 from 20 other states. This University has large endowments, the benefactions of individuals and societies, and to these additions are being made every year. It has a high reputation as a school for higher culture and training—one that does its work thoroughly well.

The annexed table presents the statistics of the *advanced, technical* and *higher* schools—not state institutions—for the year 1872-'3.

* Copied by permission from Scribner's Magazine, New York.

[illegible]

The educational work done in Virginia in 1871-'2 is summed up by the Superintendent of Public Instruction in this way—

Number of Public SCHOOLS.....	3,695
Number of Private Primary Schools.....	647
Number of High Schools.....	181
Number of Colleges.....	10
Number of Technical Schools.....	12
	<hr/> 850
Whole number of Schools in State.....	<hr/> 4,545 <hr/>
Number of TEACHERS in Public Schools.....	3,853
Number of TEACHERS in Private Primary Schools.....	715
Number of TEACHERS in High Schools.....	574
Number of TEACHERS in Colleges.....	124
Number of TEACHERS in Technical Schools.....	66
	<hr/> 1,479
Whole number of teachers in State.....	<hr/> 5,332 <hr/>
Number of PUPILS in Public Schools.....	166,377
Number of PUPILS in private Primary Schools.....	10,320
Number of PUPILS in High Schools.....	7,491
Number of PUPILS in Colleges.....	1,813
Number of PUPILS in Technical Schools.....	853
	<hr/> 20,477
Whole number attending schools.....	<hr/> 186,854 <hr/>
Average cost of TUITION per month in Public Schools, per enrolled pupil.....	\$0.70
Average cost of TUITION per month in Private Primary Schools.....	1.90
Average cost of TUITION per month in high Schools.....	4.91
Average cost of TUITION per month in Colleges and Technical Schools.....	7.00
Average cost of TUITION per month in all grades, per enrolled pupil.....	<hr/> \$3.62 <hr/>
Average length of session of Public Schools, in months.....	5.72
Average length of session of Private Primary Schools, in months.....	6.75
Average length of session of High Schools, in months.....	8.33
Average length of session of Colleges and Technical Schools, in months.....	9.00
Average time for all grades, in months.....	<hr/> 7.45 <hr/>

The school population—those between 5 and 21—was 411,021; so over 45 per cent. of the whole of this class attended schools of some kind during the year, showing that the ample facilities furnished were well made use of.

The Reports of the Superintendent of Public Instruction furnish the following facts in regard to collegiate education in Virginia:

The number of students attending her colleges has been as follows: in 1860 there were 1,738; in 1870 there were 1,936; in 1871, 1,930; in 1872, 1,799; in 1873,

the numbers were 2,087, and in 1874, 2,168. The number of students from Virginia in 1872 was 909; in 1873 it was 1,235, and in 1874, 1,287.

The following table presents the statistics of college attendance in 1872 for the leading states:

	Number attending in the State.	Number from the State in it.	Number from other States.	Number in other States.	Whole number from each State.	NUMBER BELONGING TO STATE. IN PROPORTION TO POPULATION ATTENDING COLLEGE.	
						To White Population.	To Whole Population.
New York.....	2,213	1,668	545	774	2,442	1 in 1,773	1 in 1,790
Virginia.....	1,813	921	857	65	986	1 in 722	1 in 1,233
Ohio	1,639	1,301	338	409	1,710	1 in 1,521	1 in 1,557
Pennsylvania.....	1,622	1,145	427	474	1,669	1 in 2,011	1 in 2,110
Massachusetts	1,186	656	530	246	902	1 in 1,588	1 in 1,615
Connecticut.....	887	244	643	88	332	1 in 1,529	1 in 1,630

In Scotland the number at college is said to be 1 in 1,000, in Germany 1 in 2,500 and in England 1 in 5,800 of the population. In 1872-'3 there were, omitting Hampton, 1,937 students in the Virginia colleges—1,124 from the State and 813 from other states. These statistics show that Virginia stands in the *front rank*, for *the whole world*, in higher education.

CHAPTER X.

SECTION I.—INTERNAL IMPROVEMENTS AND TRANSPORTATION.

Virginia is well supplied with lines of railways and canals now in operation, and when those that are in progress or projected are completed, every portion of the State will be accessible by such improvements. Numerous turnpikes have been constructed by the State between important points in all sections, but more especially in the Blue Ridge, Valley and Appalachian ones; so there is no portion of the mountain region that has not been penetrated by well constructed highways.

The common roads of the State are very numerous, but the wear and neglect of a long war left most of them in a bad condition; they are, however, being improved under a "road law" that in due time will give to every part of the country good roads. In navigable waters the State is unrivaled, and lines of transportation, for both coastwise and foreign commerce, reach every portion of the large Tidewater country.

The RAILWAY SYSTEM of the State should first be regarded as a whole not only in reference to the State, but to the great through lines and general system of the United States, of which they form a part.

The ATLANTIC, MISSISSIPPI AND OHIO RAILROAD (A., M. & O.), is the longest line in the State. Commencing at the splendid harbor of Norfolk (which is but a few miles from the sea and accessible at all seasons to the largest vessels afloat, where it meets lines of steamers and sailing vessels plying in all directions, especially lines of steamers that run in connection with it to New York and to Baltimore, and with the Seaboard Railroad to the south) it runs northwest, west and southwest for 408 miles, across Tidewater, Middle, Piedmont, Blue Ridge and for 150 miles along the Great Valley to Bristol, on the Tennessee line, where it connects with the railways that extend south, southwest and west to Mobile, New Orleans, Memphis, &c., making it part of a grand trunk line from the ocean westward and southward; its *through* cars run to the Gulf of Mexico and to the Mississippi river.

The first division of the Atlantic, Mississippi and Ohio—the *Norfolk and Petersburg*—is the 81 miles across Tidewater between those cities, running southwest for 23 miles to Suffolk, a flourishing town at the head of navigation, on the Nansemond, near which it intersects the Seaboard and Roanoke Road to Weldon, in North Carolina, and south; then its course is northwest, nearly parallel to the James, through the middle of the Southside peninsula, by Windsor, Zuni, Ivor, Wakefield, Waverly and Disputanta stations, to Petersburg, at the head of tide on the Appomattox, a

flourishing manufacturing and commercial city, where it meets the City Point branch of the Atlantic, Mississippi and Ohio, down the Appomattox to the James, the Richmond and Petersburg and the Petersburg and Weldon Railroads.

The *Southside Division* of the Atlantic, Mississippi and Ohio Road extends northwest from *Petersburg*, through the Middle Country, to *Lynchburg*, 123 miles, passing through Sutherland's Church Road, Ford's, Wilson's, Wellville, Blacks and Whites, Nottoway courthouse, Burk's (where it is crossed by the Piedmont Air-Line Road, formerly the Richmond and Danville, a through line from Richmond to the south and southwest), Rice's, High Bridge, Farmville (a flourishing place near Hampden Sidney College), Prospect, Pamplin's, Evergreen, Appomattox, Spout Spring, and Concord—giving railway facilities to a large and productive region, abounding in forest resources and mineral wealth.

The *Tennessee Division* of the Atlantic, Mississippi and Ohio extends from *Lynchburg* to *Bristol*, 204 miles, across Piedmont and along the Valley. At *Lynchburg* this railroad is crossed by the line of the Washington City, Virginia Midland and Great Southern Railroad—usually called the Virginia Midland—running from Washington City, where all the lines of the United States meet, southwest along the border of Piedmont and Middle Virginia to Danville, where it joins the Piedmont Air-Line, before mentioned. At *Lynchburg* this railroad also connects with the James River and Kanawha Canal, that follows the James River up from Richmond to this important and flourishing manufacturing city, and then continues on to Buchanan, in the Great Valley, beyond which it is projected to the Ohio River, and the General Government contemplates completing it. The stations beyond *Lynchburg* are Halsey's, Clay's, Forest, Goode's, Lowry's, Liberty (the county seat of the rich county of Bedford), Thaxton's, Lisbon and Buford's in Piedmont; the railway then crosses the Blue Ridge into the Valley, in which are Blue Ridge, Bonsack's, whence lines of stages run to Lexington; Gish's, Big Lick, whence a line of stages runs to Franklin; Salem (the flourishing county seat of Roanoke county and the location of Roanoke College, and where the Valley Railroad, now in course of construction, will meet the Atlantic, Mississippi and Ohio, giving a connection northeast through Lexington, Staunton, &c., to Baltimore); Dyerle's, Lafayette, Big Spring, Shawsville, Alleghany, whence stages run to Alleghany Springs; Big Tunnel, from which a tramway runs to the Montgomery White Sulphur Springs; Christianburg, the county town of Montgomery county and the station for the Virginia Agricultural and Mechanical College, and for the Yellow Springs; Vicker's, Central, from which a railroad is projected down the Kanawha or New River 68 miles, to the Chesapeake and Ohio Railroad; New River, Dublin, the station for Newbern, the shire-town of Pulaski county; Martin's, Max Meadows, Wytheville, the fine county town of Wythe county; Rural Retreat, Atkins', Marion, the flourishing county seat of Smyth; Seven-Mile Ford, Glade Spring, from which a branch railway runs to Saltville and its great salt works and plaster banks; Emory, the seat of Emory and Henry College; Abingdon, the fine county town of Washington county, with its two female colleges—Martha Washington and Stonewall Jackson; and Goodson-Bristol, on the Tennessee line, a growing town, the seat of King's College and a flourishing female seminary.

This railway passes through as fine an agricultural region as any in the State, embracing lands of every variety and suited to every sort of culture: the "truck" or market garden lands of the Norfolk peninsula and the oyster beds and fishing grounds come first; then the sweet potato, peanut, corn, cotton and timber lands; then the fine corn and tobacco lands of the Middle country and the mineral lands of the gold belt; the rich grain lands and iron ore beds of Piedmont, the fruit lands of the Blue Ridge and its treasures of iron ore, the fertile grassy plains and hills of the Valley—the land of the stock raisers, of great corn and wheat fields, with metalliferous bands of lead, iron, zinc and copper and beds of salt, plaster and coal on either hand. It would require a volume to give the details of the unbroken stretch of 408 miles of east and west country, or more than 16,000 square miles, tributary to this great, well-built, well-equipped and well-managed railway.

By Report of 1874, the charges on this railway are: for through passengers, all classes, 3.07 cents a mile, and for way passengers 3.68. For through emigrant passengers the charge is two cents per mile; the average passenger rate is 3.54 cents. The average rate per ton per mile, on all classes of freight, is 2.41 cents.

Steamships from Liverpool connect with this line at Norfolk, and it conveys immigrants on to the west. This railway conveyed over 193,000 bales of cotton to Norfolk in 1874, or 42 per cent. of the 467,561 bales received by that city.

The Atlantic, Mississippi and Ohio is to be extended from Bristol, west, along the state line, 100 miles to Cumberland Gap, where it will meet a system of railways from Kentucky. This will be a very valuable extension, opening up a country rich in farming and grazing lands and in metallic wealth. It is also proposed to extend the line from Saltville across to Pound Gap, on the Kentucky line, to meet railways coming up from the Ohio river. This will bring the iron and coal of Appalachia into market. A charter has also been granted for a road from the Atlantic, Mississippi and Ohio down New River to the Chesapeake and Ohio, opening a way for the interchange of iron ore and coal with West Virginia, and developing a fine agricultural region. Lands of *every variety* and *price* are for sale along the whole length of this road—far cheaper than any of the wild lands of the West.

The second line in length in Virginia, the WASHINGTON CITY, VIRGINIA MIDLAND AND GREAT SOUTHERN RAILROAD (W. C., V. M. & G. S.), or Virginia Midland (the consolidated Orange and Alexandria, Manassas Gap and Lynchburg and Danville Railroads), now runs from Alexandria southwest, along the line of the Middle and Piedmont and through the Piedmont and Middle country, 216.5 miles to Danville. The cars of this company run from Washington City, and they pass over a portion of the Chesapeake and Ohio Railroad; so this may, with propriety, be considered a line of 240 miles from Washington to Danville—the *real Piedmont Railway* of the State. It is now a part of the great mail line to the south and southwest. At Washington, the Capital of the United States, it meets lines of railways from all directions and ships and steamers near the head of tide on the Potomac. At Alexandria, 7 miles below, its next station, it meets the terminus of the Chesapeake and Ohio Canal, that has come down the Potomac from Cumberland; the Washington and Ohio Railway, that runs to Round Hill, in Piedmont, and is projected to the Ohio by way of Winchester, and crosses the railway from Washington to Rich-

mond. Alexandria is a flourishing commercial city, from which steamers and vessels go up and down the Potomac. The stations, in order, are Springfield, Burke's, Fairfax, Clifton, Manassas (at which point the branch Manassas Gap Railroad leaves the main line and runs 61 miles across Piedmont and the Blue Ridge to the Valley Railroad at Strasburg), Bristoe, Nokesville, Catlett's, Warrenton Junction (from which a branch runs northwest 10 miles by Melrose to Warrenton, the county town of the fine county of Fauquier), Midland, Bealeton, Rappahannock, Brandy, Culpeper (the growing county seat of Culpeper county), Mitchell's, Rapid Anne, Orange Courthouse (the seat of justice for Orange county), Madison Run, Gordonsville, where it meets the Chesapeake and Ohio Railroad from Richmond, and runs over its line 21 miles past Lindsay's, Cobham, Keswick and Shadwell stations to Charlottesville, the county seat of Albemarle county, and near which is located the University of Virginia; it there leaves the line of the Chesapeake and Ohio, which crosses the Blue Ridge and the Valley, via Staunton, and Appalachia on to the Ohio river, &c. At Charlottesville the Midland Road is fairly *into* Piedmont, and thence it passes Red Hill, North Garden, Covesville, Faber's Mills, Rockfish, Elmington, Lovingsston or Montreal (near the courthouse of Nelson county), Arrington, Tye River, New Glasgow, Amherst (the county town of Amherst county), McIvor's and Burford's to Lynchburg, where are the James River and Kanawha Canal and the Atlantic, Mississippi and Ohio Road, before described, giving connections East, West and South. From Lynchburg the stations are Lucado, Lawyer's Road, Covington, Otter River, Lynch's, Staunton River, Sycamore, Ward's Springs, Galveston, Whittles, Chatham (the county town of the large county of Pittsylvania), Dry Fork, and Fall Creek, to Danville,* a flourishing manufacturing town on the Piedmont Air-Line Road, from Richmond south and southwest.

The MANASSAS BRANCH of the Midland passes through the following stations from Manassas: Gainesville, Hay Market, Thoroughfare, Broad Run, The Plains, Salem, Rectortown, Piedmont and Markham in the Piedmont country; Linden on the Blue Ridge, and Happy Creek, Front Royal (county town of Warren county), Riverton (where the Shenandoah Valley Railroad crosses it), Buckton, Water Lick and Strasburg, to Strasburg Junction, in the Valley.

*The following statistics of the thriving town of Danville are compiled from a letter by J. T. Averett, Esq., in the Richmond Dispatch of January 6th, 1876:

Danville, Pittsylvania County, Virginia.

Years.	Population.	Value of personal property.	Value of real estate.	TOBACCO TRADE.			
				Pounds sold at warehouses.	Value of official sales.	Average per hundred.	Internal revenue receipts.
1870	3,464	\$524,155	\$1,020,620	10,621,557	\$1,301,140 73	\$12 25	.....
1871	3,990	527,691	1,141,030	13,191,406	1,582,968 72	12 00	.....
1872	4,320	658,722	1,229,710	14,065,639	1,746,413 10	12 34	.....
1873	5,130	921,906	1,337,375	14,181,890	1,694,524 96	11 94	\$ 948,377 49
1874	5,552	813,627	1,421,725	18,582,389	2,707,231 82	14 56	1,311,822 71
1875	6,183	919,844	1,506,735	15,018,640	2,761,154 85	18 33	1,041,591 76

(See table, continued, foot of next page.)

This very important railroad, operating 287½ miles and owning 337½ miles of line, and having over 10,000 square miles of country tributary to it, is becoming a most valuable auxiliary in the development of the State, as it not only passes through or near a fine farming, grazing or planting country for its whole length, branches included, but it runs for a long distance in one of the most attractive and promising iron producing regions in the State. As a *through* line it is the most direct from the National Capital for the whole of the great Piedmont country of Virginia, North Carolina, South Carolina and Georgia, on to the Gulf. As a State line it passes through the brown-stone quarries and good wheat lands of Manassas; has tributary to it all the Piedmont country, with its exceedingly rich and productive lands, among them the noted "red lands" of Amherst, Nelson, Albemarle, Orange, &c.; it has penetrated the fine timber lands of Campbell and Pittsylvania; it enters the Shenandoah Valley, crossing the Blue Ridge; it crosses the valleys of the Roanoke and the Dan, famed for their crops of tobacco, corn, &c. The abundant magnetic, hematite and specular iron ores of Culpeper, Orange, Albemarle, Nelson, Amherst, Campbell and Pittsylvania counties are along its line for nearly 200 miles, not to mention the lead, manganese and other ores here also found. This company has obtained, by grant or purchase by permission of the State, large tracts of land within five miles of its lines, which it will sell to intending settlers on long time and at reasonable rates. The rates of fare of this railway, per mile, are 4 cents for first class through and 4½ for first class way passengers, and 2½ and 3 cents for second class through and way respectively, averaging 4 cents a mile. The charges for freight average 4.44 cents a ton per mile, ranging from .94 of a cent to 7.55 cents.

The affairs of the company are well managed, and it has a future, as a great through line across the State, of great prosperity and usefulness before it.

THE CHESAPEAKE AND OHIO RAILROAD (C. & O.) has 222 miles of its 423 between Richmond and Huntington, on the Ohio, in Virginia. This is part of a great through line from some harbor of "The Peninsula," on or near Chesapeake bay, to the Mississippi at St. Louis, all completed but about 80 miles in Kentucky and the line down The Peninsula from Richmond. The road now in operation runs northwest from Richmond across the Middle, Piedmont, Blue Ridge, Valley and Appalachian country to West Virginia, and then across the Trans-Appalachian country in that State to the valley of the Ohio.

The *Eastern Division* of the Chesapeake and Ohio extends from Richmond to

These figures show more forcibly than words the prosperity of this city :

Danville—Its December Tobacco Trade.

DECEMBER SALES OF LEAF TOBACCO AT WAREHOUSES.

Years.	Pounds.	Value.	Average per hundred.	Internal revenue receipts.
1872	507,343	\$ 40,028 62	\$ 8 89	\$45,293 30
1873	247,806	15,035 00	6 06	82,214 20
1874	951,689	196,798 43	20 67	58,265 10
1875	1,240,847	114,450 00	9 24	47,784 18

Staunton, in the Valley, 136 miles. It begins at new wharves belonging to the company, at the Harbor of Richmond, where ample arrangements have been made for shipping the immense quantities of coal, iron, timber, &c., that will pass over the road. It meets at Richmond the various lines that are named as terminating there. Vessels drawing 14 feet of water ascend the tides of the James to this point. The stations of this Division are Atlee's, Ashcake, Peake's, Hanover Courthouse, the county town of Hanover county; Wickham's, South Anna, Hanover Junction, where it crosses the line of the Richmond, Fredericksburg and Washington Railroad; Anderson's, Noel's, Hewlett's, Beaver Dam, Green Bay, Bumpass', Buckner's, Frederick's Hall, Tolersville, Louisa Courthouse, the county seat of Louisa county; Trevilian's, Green Springs, Melton's and Gordonsville, in the Middle country. At Gordonsville, as before stated, it meets the Midland Railroad from Washington City, and to the same point the Fredericksburg and Gordonsville Railroad is nearly completed; thence the road skirts Piedmont by Lindsay's, Cobham, Campbell's, Keswick and Shadwell, when it turns across Piedmont by Charlottesville—the seat of the University of Virginia and county town of the great county of Albemarle, where the Midland Railroad diverges to the southwest—Ivy and Mechum's River; then Greenwood and Afton on the Blue Ridge; and in the Valley, Waynesboro' and Fishersville to Staunton, the thriving county town of Augusta county and the seat of four female colleges, where the Valley Railroad from Baltimore crosses the Chesapeake and Ohio and runs to the Atlantic, Mississippi and Ohio at Salem. The *Middle Division* extends from Staunton to Hinton, West Virginia, 136 miles, and the *Western Division* from Hinton to Huntington, 148 miles. The station beyond Staunton, in the Valley, is Swoope's; then in Appalachia, Buffalo Gap, North Mountain, Variety Springs, Elizabeth Furnace, Pond Gap, Craigsville, Bell's Valley, Goshen—from which point lines of stages run to Lexington, the seat of Washington and Lee University and the Virginia Military Institute and to the Alum Springs of Rockbridge—Panther Gap, Millboro'—from which stages run to the Bath Alum, Warm, Hot and Healing springs—Mason's Tunnel, Crane's, Griffith's, Longdale, Peter's (whence a narrow gauge railway extends to the Lucy Selina Furnace, of the Longdale Iron Company), Clifton Forge—where it meets Jackson's river of the James and the line of the extension of the James River and Kanawha Canal, the Central water line, and where a branch line of the Chesapeake and Ohio is proposed down the James to Richmond, following the grade of the river; also a line some 30 odd miles long to the present terminus of the canal at Buchanan—Jackson's River, Lowmoor—from which a short branch runs to the Lowmoor iron mines—Covington, the county town of Alleghany county, from which stages run to the Healing, Hot and Warm Springs; Callaghan's and Alleghany (from which stages run to the Sweet Chalybeate and Sweet Springs), where the railroad passes into West Virginia. As a *through* line, with railway, steamboat and steamship connections east and west to all important points, with the lowest grades of any line in the United States across the Appalachian system of mountains, with its course in the mild latitude of Virginia, and with its shorter distances from the seaboard to all points in the West and Northwest, this is to become one of the most important trans-continental lines of the United States. This line was opened to the Ohio in 1873. As a *state* line this crosses the gold and iron belt of Middle Virginia, the magnetic, &c., iron belt of Piedmont, the spe-

cular and brown hematite iron belt of the Blue Ridge, the iron and limestone beds of the Valley, runs for 70 miles *with* the *brown* and *red* central iron ore belt of the Appalachian region; and for 86 miles literally runs *through*, by the cañon of New River and the Great Kanawha, in West Virginia, the beds of the Lower, Middle and Upper series of the great Appalachian Coal-field, where more than an aggregate of 80 feet of thickness in these three measures of cannel, splint, shop and other varieties of Bituminous Coal are exposed in nearly horizontal strata above the water level. The *mere mention* of these facts shows that this is to be one of the largest iron producing regions in the United States (see chapter on Geology), where raw coals and rich ores may be cast, as they are mined, into the furnace. The farming, planting and grazing lands along the whole line are among the best in the State, and the country adjacent thereto is rapidly developing. The trade over this railway, westward, from the oyster beds, fishing banks and market gardens of Tidewater must be large. The open character and unsurpassed excellence of the harbors at its eastern termini will bring to it the imports of all lands in and beyond the Atlantic. In fact, all the lines that terminate near the capes of Virginia must become the "*grocery* lines*" for the central belt of population of both continents. The Mediterranean products of Europe, the sweets and coffee of the West Indies and South America, will naturally come here for distribution to the interior of North America, and the products of the West for distribution along the Atlantic coasts of the Americas and Europe.

In the 8,000 square miles of country in Virginia that finds its outlet over this road there is an abundance of every variety of farming and of iron lands for sale at from one dollar and fifty cents to one hundred dollars per acre, depending on location, improvements, &c. The rates for first class passengers are 3 cents for *through* and 4 cents for *way* per mile; for second class, 2 cents *through* and 3 cents *way*—averaging 3 cents per mile. The rates for freight are from 1½ to 4 cents a ton per mile, averaging 2 1–20 cents per ton a mile.

THE RICHMOND AND DANVILLE RAILROAD, a portion of the *Piedmont Air-Line* from Richmond to Atlanta, Georgia, extends from Richmond southwest to the state line just beyond Danville, 140½ miles, passing through the midst of the great Middle country, where it is noted as a tobacco producing region.

At the large and flourishing city of Richmond, the beginning of this line, this road meets the numerous lines of railways, canal, steamers, &c., that centre there; thence the stations are Manchester, the improving suburb of Richmond across the James, the county town of Chesterfield county, whence a branch extends to the harbor of Richmond at Rocketts; Belle Isle, Rockfield, Granite, Coalfield, the heart of the Richmond coal-basin; Tomahawk, Powhatan, Mattoax, Chula, Amelia Courthouse, the shire town of Amelia county; Jetersville, Jennings' Ordinary, Burkeville, where it crosses the line of the Atlantic, Mississippi and Ohio, giving connections east and west (see Atlantic, Mississippi and Ohio); Green Bay, Meherrin, Keysville, the junction with the proposed Roanoke Valley Railroad; Drake's Branch, Mossingford, Randolph, Roanoke, Clover, Scottsburg, Wolf Trap, Boston, New's Ferry, Barksdale Sutherlin, Ringgold and Danville, where it meets the Midland Railroad from Wash-

* Colonel James McDonald, Secretary of the Commonwealth of Virginia.

ington and Lynchburg and its own extension to Atlanta, Mobile and New Orleans.

As a through line, this connects with a line from Washington City to Richmond, and so becomes a very important line for trade and travel to the south and southwest; a line especially for bringing the products of the great southern Piedmont region to Virginia markets. As a local line the Richmond and Danville may claim the trade of over 8,000 square miles of territory—one of the most productive in the Middle country, and at the same time much of the trade of southwest Piedmont and Blue Ridge must also find its outlet by it. It passes through the Richmond coal-field and the fine granite quarries along the James; its line is near and on the combined gold and iron belt; copper, soapstone and other minerals await development in its vicinity. Fine bodies of magnetite are near the line of this railroad. A line of railway is in course of construction up the valley of the Roanoke from Clarksville to Keysville, on this railroad, which will bring to it the products of a very fertile country. There are many farms on this railway for sale at exceedingly low prices, and some thriving settlements have been made on or near it by English, Dutch and other settlers. The average rate per mile for through passengers is 3.39 cents, for 1st class way passengers 4 cents, and for 2nd class way $3\frac{1}{2}$ cents—averaging 3 63–100 cents per mile. The average charge for freight is 4.08 cents a ton a mile.

The RICHMOND, FREDERICKSBURG AND POTOMAC (80 miles) and a portion of the BALTIMORE AND POTOMAC RAILROAD are run as one line from Richmond to Washington City and Baltimore, forming part of the great north and south railway that runs along the border between the Middle and Tidewater sections from New York city on through Virginia, by way of Washington, Alexandria, Fredericksburg, Richmond, Petersburg, Weldon, &c., to the south.

The Richmond, Fredericksburg and Potomac runs for 82 miles to Quantico, on the Potomac river, passing through Boulton, Hungary, Kilby's, Ashland, the seat of Randolph Macon College; Taylorsville, Hanover Junction, where it crosses the Chesapeake and Ohio Road; Chester, Penola, Milford, near Caroline Courthouse; Wordford, Guinea's, Fredericksburg, 61 miles from Richmond, and an important commercial and manufacturing city at the head of tide on the Rappahannock; Potomac Run, Brooke's, Richland, to Quantico, where it meets a line of steamers to Washington and joins the line of the Alexandria and Potomac (or Baltimore and Potomac Railroad), which continues its rail connection by Cherry Hill, Mount Pleasant, Wood Bridge, Long Branch, Franconia, and Alexandria city—where it crosses the Midland, Washington and Ohio, &c.—to Washington City. This has long been the favorite route for travel to the south, and is noted for its good management and most comfortable accommodations. Its *directness* will always make it a great trunk line. Locally, this passes through much exceedingly fine country, the valleys of the branches of the Pamunkey, the Mattaponi, the Rappahannock and Potomac—all famed for their fertility, fine climate, pure water, &c., where many desirable homes and most valuable plantations are offered for sale at merely nominal prices—the result of the destruction incident to war.

The gold belt, with its valuable ores of iron, is not far away, on one side, and the marl beds of the Tertiary are near at hand on the other—both full of promise

for future operations. The fine water-power of the Rappahannock, at the Falls near Fredericksburg, is partially utilized in manufacturing woollens, paper, &c., but it has an abundant supply for many operations on a large scale. The line of railway once completed to Gordonsville, crossing the gold and iron belt and connecting by the Chesapeake and Ohio with the coal-fields of Trans-Appalachia, this must become a manufacturing centre in the midst of large agricultural resources. The average charge for passengers on the Alexandria and Fredericksburg Road is 3 1-20 cents per mile, and for freight 3.1 cents. The average freight rate on the Richmond, Fredericksburg and Potomac was 4.17 cents per ton per mile. The speed of passenger trains is from 25 to 30 miles per hour.

THE RICHMOND AND PETERSBURG RAILROAD, 23 miles long, is a southern extension of the lines just described; it connects with them by a tunnel under a portion of Richmond, then crosses the James, through Manchester, Temple's, Drewry's Bluff, Halfway, Chester—near which it has a branch road into the Chesterfield part of the Richmond coal-basin and across its line to Osborne's, a landing on the James, where the coal is put into vessels—to Petersburg. This is an exceedingly well managed road, important as a link in the line of through trade and travel and as the outlet for the fine coal on its *Clover Hill Branch*. There is much land along it that needs inhabitants. At Petersburg it finds a flourishing city, the line of the Atlantic, Mississippi and Ohio Road, before spoken of, and the extension of the North and South line by the Petersburg and Weldon Railroad. The average fare is 3½ cents a mile, and the average rate of freight 3 cents per ton. The speed is from 23 to 28 miles an hour.

THE PETERSBURG AND WELDON RAILROAD is another link in the North and South railway system, extending from Petersburg 63 miles, through Reams', Stony Creek, Jarratt's, Belfield, Hicksford, Gaston Junction, where the road branches, one branch going by Ryland's to Gaston and on to Raleigh, North Carolina—the other to Weldon, through Pleasant Hill and on to Goldsboro', North Carolina, and southward. At Weldon it meets the line of the Seaboard Railroad from Norfolk. This, like the Richmond and Petersburg, is important as part of the *through* line, the passenger cars running without change all the way from Washington to Weldon. It has a large scope of fertile country in the "cotton belt," the valleys of the Nottoway, Meherrin and Roanoke and their branches pertaining to it, in which there is much valuable land, some farms on the line of the railway being offered at \$10* per acre.

THE SEABOARD AND ROANOKE RAILROAD extends from Portsmouth, opposite Norfolk and on its harbor, 80 miles southwest to Weldon, in North Carolina, making, by bay steamers from Baltimore, a daily line to the south by what is known as the "Atlantic Coast Line." At the splendid harbor of Norfolk this road connects with lines of steamers from all points and the Atlantic, Mississippi and Ohio Railroad; then it passes by Bower's Hill through Suffolk, the active county seat of Nansemond county, near which it passes under the Atlantic, Mississippi and Ohio; Buckhorn, Carrsville, Franklin, on the Blackwater, where it meets steamboats from the Chowan; Murfee's, Nottoway, Newsom's, Boykin's, Branchville, Margarettsville, Sea-

board and Gary's, to Weldon, where it joins the Petersburg and Weldon Railroad. This is an important line for trade from the cotton and naval stores region of North Carolina, and for cotton and travel from beyond; its traffic is very large by its line of steamers to the great cities. It runs through the heart of the best cotton producing part of Virginia, including the valleys of the Nansemond, Blackwater Notoway, Meherrin, &c. In this region the noted sweet potato, truck and cotton lands are offered at from \$8 and upwards* per acre.

The RICHMOND, YORK RIVER AND CHESAPEAKE RAILROAD runs east from Richmond 38½ miles to the head of York river, the junction of the Mattapony and Pamunkey, at West Point, where it connects with a line of steamers for Baltimore by the way of Yorktown, Gloucester Point and other landings on the York, the length of the line to Baltimore being 220 miles. The stations from Richmond (where this road forms a close connection with the Richmond and Danville) are Fair Oaks, Dispatch, Summit, Tunstall's, White House, Fish Haul and Sweet Hall, to West Point. The time from Richmond to Baltimore is some 14 hours, giving a fine ride over the York and the Chesapeake—as noble a river and bay as can well be found. This is an important line for freight and travel, and its tributary country, the valleys of the Chickahominy, Pamunkey, Mattapony and York, are among the most fertile in Tidewater Virginia. Here, too, are lands and homes at nominal prices. The rate of fare is from 2½ to 5 cents a mile, averaging 4.36 cents. The average rate per ton for freight is 3.37 cents per mile.

The WASHINGTON AND OHIO RAILROAD is a line that is intended to run from the harbors of Alexandria and Washington on the Potomac, by way of Leesburg, Winchester, in Virginia, and Capon Springs, Moorefield, &c., in West Virginia, and thence westward to Point Pleasant, at the mouth of the Great Kanawha on the Ohio, a distance of 325 miles, making the most direct line westward from the National Capital. Only 55 miles of this road are completed from Alexandria northwest across Middle and into Piedmont, passing through Carlin's Springs, Fall's Church, Vienna, Hunter's Mill, Thornton, Herndon, Guilford, Farmwell, Leesburg, the county seat of the splendid county of Loudoun; Clark's Gap, Hamilton, Purcellville, Round Hill, to Snickersville, where it connects with a line of stages across the Blue Ridge by Berryville to Winchester, in the Valley, on the line of the Valley branch of the Baltimore and Ohio.

This road, when completed, will be one of the most important routes in the country, and will open a region of unsurpassed mineral wealth. It now runs through and into one of the very finest and most productive sections of the State, rich in grain and pasture lands, and with deposits of iron, marble, limestone, &c., of great value. The lands here are higher in price than in other portions of the State, owing to their nearness to markets as well as their excellent character; but they are by no means as high as similar lands in other states. The valuable iron ores of the western slope of the Blue Ridge will be crossed by this road 62 miles from Alexandria. It soon penetrates the eastern part of the Appalachian coal-field in West Virginia. Average fare per mile, for passengers, four cents; average rate for a ton freight, per mile, seven cents, ranging from four to ten and two-thirds.

The VALLEY RAILROAD, a branch of the great Baltimore and Ohio, that begins at Harper's Ferry, on the Baltimore and Ohio, at the mouth of the Shenandoah, and extends up the valley of that noted river by Winchester and Staunton to its head, and then across the valley of the James by Lexington, and the Roanoke to Salem, following the Great Valley for 213 miles, of which 193 are in the State of Virginia. The part in operation is from Harper's Ferry to Staunton; the rest is being constructed. This road is formed by a combination of the Winchester and Potomac, the Winchester and Strasburg, the Strasburg and Harrisonburg part of the Manassas Gap Railroad, and the Valley Railroad from Staunton to Salem.

The stations are Harper's Ferry, 81 miles from Baltimore and 41 miles from Washington City; and Charlestown, in West Virginia, where it crosses the partly made Shenandoah Valley Railroad; in Virginia—Wadesville, Stephenson's, Winchester, the flourishing county town of Frederick; Kernstown, Bartonsville, Newtown, Vacluse, Middletown, Capon Road, Strasburg, where the Manassas branch of the Midland Railroad unites with this; Tom's Brook, Maurertown, Woodstock, the county town of Shenandoah county; Edinburg, a thriving village; Mt. Jackson, Forestville, New Market, an active business place, the seat of a Polytechnic Institute, and the point of departure of stages for Luray and across to Culpeper by Sperryville; Broadway, Cowan's, Linville, Harrisonburg, a large and flourishing town, the county seat of the rich and fertile county of Rockingham, from which point the Shenandoah Valley and Ohio Railroad is now being located via Franklin, Pendleton county, West Virginia, to some point on the Ohio; and the "Washington City and St. Louis Narrow Gauge Railroad" is being constructed by way of Bridgewater, Monterey, in Highland county, and on through West Virginia, aiming for St. Louis, Missouri; Mount Crawford, Rockland Mills, Mount Sidney, Verona to Staunton, the thriving county seat of the large and wealthy county of Augusta, where it forms a junction with the Chesapeake and Ohio, and to which point the Shenandoah Valley Railroad is being constructed. Beyond Staunton the Valley Railroad is under process of construction, and will pass through Mint Spring, Greenville, Midway, Fairfield, Lexington, the county town of the fine county of Rockbridge, the seat of Washington and Lee University and the Virginia Military Institute, and the terminus of the North River Branch of the James River and Kanawha Canal; Natural Bridge, Buchanan, where it crosses the main line of the James River and Kanawha Canal; Botetourt Springs, where Hollins' Institute, a female college, is located, to Salem, the seat of Roanoke College, where, as before stated, this railroad connects with the Atlantic, Mississippi and Ohio.

A glance at the map will show that this railway is an important part of several through lines. When completed to Salem, it will finish a connected line of railways from New York to New Orleans, running for nearly eight hundred miles along the Great Appalachian Valley (as the one between the Blue Ridge and the Kitatinny mountains is often called), by far one of the most beautiful and productive valleys in the United States, and abounding in mineral wealth. It also forms part of a through Western line by way of the Chesapeake and Ohio, and of a Southern one by that and the Midland. As part of the great system of roads owned or operated by the Baltimore and Ohio, this will have many advantages for shipment to and from all the noted centres of business activity. Locally this road passes for

its whole length through a rich farming and grazing country, that always sends vast amounts of grain, farm products of all kinds and cattle to market. On each side of it are the great iron belts of the Blue Ridge and of Appalachia; and as it crosses at right angles the roads and canal from the coal-fields, it must become the great artery for the distribution of coal and iron ore. The population of the Valley is still small compared to its productive area, and so it has much fine land for sale at prices ranging from \$10 to \$150 per acre, according to improvements, location, &c., or at from one-fourth to one-half the value of such lands in the more thickly peopled parts of the same Great Valley in Pennsylvania and other states.

The SHENANDOAH VALLEY RAILROAD is in process of construction from Hagerstown, by Williamsport, in Maryland; Shepherdstown and Charlestown, West Virginia; and Berryville, the county seat of Clarke; Front Royal, of Warren, and Luray, of Page counties; up the valley of the South Fork of the Shenandoah, by Port Republic, New Hope, &c., to Staunton; from that point the road has not been definitely located, but it is expected that it will enter Appalachia and pass through Alleghany, Craig, Giles, Tazewell, Russell, Scott and Lee counties, and into East Tennessee to the system of railways there in operation. This will form part of the system of the Pennsylvania Railroad Company, connecting roads under its control, making a line of 449 miles from Hagerstown, Maryland, to Russellville, Tennessee.

The indication of the route is sufficient, coupled with what has been said of the country along it in the chapters of this summary, to show that this will become a most valuable highway for mineral and agricultural traffic, as well as for travel.

A charter has been obtained for extending the Railroad that now runs from Hagerstown, in Maryland, to *Martinsburg*, in West Virginia, on up the valley some 22 miles to *Winchester*, connecting important railways.

The NORFOLK AND GREAT WESTERN RAILROAD has been located through the whole southern tier of counties of the state from Norfolk to Cumberland Gap, by most of the county towns of this range of counties, and by Danville, Bristol, &c. This would make a very direct line from Norfolk to the West, and would open a large and fertile portion of the state now distant from railways. A portion of the line would pass through the magnificent mineral deposits of Southwestern Virginia. Nothing is being done to this road now, but at no distant day the merits of the line will secure its construction. Among other *proposed* lines are: one from *Danville* by *Rocky Mount* to *Salem*, one from *Farmville* to *Charlottesville* and northeast through Piedmont; one from *Staunton* to Washington City by the most direct route; one down the Eastern Shore peninsula, &c. Others have been named in connection with the roads of which they will form a part. The Roanoke Valley Railroad is in course of construction from Clarksville to Keysville.

HORSE RAILROADS are in operation in Richmond, Norfolk and Alexandria.

Table of Railroads in operation in Virginia January 1st, 1876.

NAME OF RAILROAD.	Length in Virginia.	TERMINAL STATIONS IN VIRGINIA.	TERMINUS IN OTHER STATES.	Whole length run.
	Miles.			
Atlantic, Mississippi & Ohio.....	408	Norfolk and Bristol-Goodson.....	.....	427
City Point Branch of A., M. & O.....	9	Petersburg and City Point.....	.....
Saltville Branch of A., M. & O.....	10	Glade Spring and Saltville.....	.....
Washington City, Va. Mid. & Gr. Southern	243*	Washington and Danville.....	Washington.....	315
Manassas Branch.....	63	Manassas and Strasburg Junction.....	.....
Warrenton Branch.....	9	W. Junction and Warrenton.....	.....
Chesapeake & Ohio.....	222	Richmond and Alleghany.....	Hunt'g't'n, W. Va.	434
Longdale (narrow-gauge) Branch.....	8	Longdale Junction and Furnace.....	.....
Lowmoor Branch.....	2	Lowmoor Junction and Lowmoor.....	.....
Richmond & Danville.....	141	Richmond and Danville.....	Atlanta, Ga.....	547
Richmond, Fredericksburg & Potomac..	82	Richmond and Quantico.....	.....	123.
Coal Pits.....	4	.....	.....
Alexandria & Potomac.....	27	Alexandria and Quantico.....	.....
Alexandria & Washington.....	7	Alexandria and Washington.....	Baltimore.....	106
Richmond & Petersburg.....	23	Richmond and Petersburg.....	.....
Petersburg & Weldon.....	50	Petersburg and North Carolina Line....	Weldon, N. C....	
Gaston Branch.....	15	.....	Gaston, N. C....	80
Clover Hill.....	29	Osborne's and Clover Hill.....	.....
Seaboard & Roanoke.....	60	Portsmouth and North Carolina Line....	Weldon, N. C....	
Richmond, York River & Chesapeake....	38	Richmond and West Point.....	Baltimore.....	38.
Washington & Ohio.....	52	Alexandria and Round Hill.....	.....	52
Valley Railroad.....	104	Wadesville or W. Va. Line and Staunton	Baltimore.....	207
Fredericksburg & Gordonsville†.....	20	Fredericksburg and Gordonsville.....	.....	20.
Miles of completed railroad in Virginia January 1st, 1876.....	1,617			

To summarize the railroad systems of the state in operation—

Tidewater has a north and south line *connecting the "head of tide"* of its navigable streams, and another system from the north coming down to the Eastern Shore.

Four lines run down its peninsulas *to deeper waters*.

Middle has north and south lines along each side of it, and one passing through half its length. The equivalent of six railways crosses the Middle Country.

Piedmont has a line along its border, and in it for four-fifths of its length, and is crossed or penetrated by five lines.

Three lines cross the Blue Ridge, and the lines along the valley are parallel to it.

The Valley has a line its whole length nearly completed, and another one-third of its length well under way: one road crosses it in the state, and another in West Virginia, near by.

One line runs for some distance with and across Appalachia.

* Including 7 miles of Alexandria and Washington Railroad, and 21 of Chesapeake and Ohio.

† But partially completed.

Eight great through lines of trade and travel either cross Virginia, to and from the centres of trade and population in other states, or start from such points in the state, and it has the advantage of being so situated as to compel the trade of a large portion of the South, Southwest and West of the United States to seek its borders.

To provide for TRANSPORTATION BY WATER, Virginia has spent large sums of money in improving the navigation of many of her rivers, not only in Tidewater, but in other portions of the state: the introduction of railways has done away with the use of most of those above tide for purposes of navigation, but the locks and dams furnish a large amount of fine water power in all portions of the state.

The navigable tidal rivers have been, and are being constantly improved, by the General Government and the cities of the state, by removing bars, opening channels, &c.

Several *canals* cross the Norfolk peninsula and connect the waters of Albemarle Sound and those of Chesapeake Bay, by way of Norfolk, making that city the entrepot for a vast system of *inland* steam and ship navigation, that will eventually embrace a large portion of the Atlantic and Gulf coasts of the United States. These canals are—

The ALBEMARLE AND CHESAPEAKE CANAL, with *two cuts*—first, the *Virginia*, eight miles long, connects the Southern Branch of Elizabeth river (the harbor of the United States Navy Yard, Gosport, a part of the harbor of Norfolk, deep enough for any vessel afloat) with the North Landing River that runs into Albemarle sound; and second, the *North Carolina Cut*, a *ship canal, open at all seasons*, from Norfolk to Albemarle sound, and all the tidal waters of North Carolina. The last is a great work, in complete order: it has but one lock, 220 feet long and 40 wide, and seven feet deep, through which vessels of 400 to 600 tons burden pass; it has a capacity for 30 millions tons a year. From 1860 to 1871, there passed through this canal 11,292 steamers, 6,832 schooners, 2,030 sloops, 5,812 lighters, 1,991 barges, 209 rafts, 6,002 boats, or 35,058 in all. Nearly 5,000 of these passages were in 1871. Steam is the motive power used. The freight brought to Norfolk by this canal embraced large quantities of cotton, salt fish, turpentine, lumber, shingles, staves, railroad ties, wood, juniper logs, bacon, peas and beans, wheat, fresh shad, watermelons, &c. The forest products of timber amounting to over 60 million feet of board measure.

The DISMAL SWAMP CANAL connects the same waters by another route, penetrating more of the swamp region of the Norfolk peninsula, but having the same kind of through trade. The receipts* by this canal for 1872 will not only give a good idea of the business of these ship canals, but also of the trade and products of the "*low country*": 1,365 bales of cotton, 8,606 barrels fish, 204,470 bushels of corn, 61,298 cubic feet of timber, 3,708,980 shingles, 179,975 staves, 166 bushels flaxseed, 13,128 bushels potatoes, 257,200 railroad ties, 5,111 cords of wood, 4,994 bushels of beans, 6,419 bushels of wheat, 7,108 cords of logs, 117,134 M. fresh shad, 127,120 plank, 14,058 posts, 113 cords of reeds for paper, 264,650 M. rails for fences, 604 cattle, 22,133 chickens, 53,523 dozen eggs.

By these canals there is a through route from North Carolina to Norfolk, then up Chesapeake bay to the Chesapeake and Delaware canal, eight feet deep and 14

*Report of President Rogers.

miles long, to Delaware bay; then by the Delaware and Raritan canal, seven feet deep and 43 miles long, to Raritan river, and by that to New York harbor.

It is hardly possible to overestimate the importance of the system of canals just described, and the effect the cheap transportation they can offer must have on the coastwise trade of nearly all the Atlantic States. An example of what may be done shows the probabilities of the near future. Barges on the James River and Kanawha canal may be loaded with iron or coal in Appalachia, and without break of bulk be delivered in Baltimore, Philadelphia, New York, Albany, many towns on the Great Lakes, &c.

The JAMES RIVER AND KANAWHA CANAL, intended to continue water navigation to the sources of the James near the White Sulphur Springs, and then, after going through the Alleghany watershed, to descend the Greenbrier, New and Great Kanawha rivers to the Ohio, has been completed by the State, at great expense, from tidewater, at Richmond, across the Middle, Piedmont and Blue Ridge and far into the Valley Country, 198 miles, to Buchanan, where the Valley Railroad crosses the James. Much work has been done on the thirty-two miles between Buchanan and Clifton Forge, where the James River and Kanawha Canal reaches the line of the Chesapeake and Ohio Railroad. That portion will no doubt be completed at an early day, putting the canal in the line of the vast transportation of coal, iron, &c., that must come over the Chesapeake and Ohio. The State has offered to give this canal to the General Government, on condition that the work be extended to the Ohio and its capacity enlarged so that it may become a great *Central Water Line*, uniting the navigable waters of the Chesapeake and the Mississippi where the distance between those waters is the shortest and where Providence has cut away many of the obstacles that on other routes oppose the improvement. It is probable that the General Assembly, at its present session (1875-'6), will authorize the extension of this canal to the mouth of Craig's creek, 15 miles up the James beyond Buchanan, and the construction of a railway thence to the Clifton Forge station of the Chesapeake and Ohio Railroad, using the convict labor of the State in the work. This route would be obstructed but little by ice, and the heat would not be so great as to injure agricultural and other cargoes that suffer from a high temperature. The work has been pronounced practicable by competent authorities. This canal is now a valuable commercial line up the fertile valley of the James, with its large products of agriculture, to Lynchburg, a thriving commercial and manufacturing city, where it is brought into connections with the Atlantic, Mississippi and Ohio and the Midland railroads. Its continuation into the Valley by its main line to Buchanan and to Lexington by a branch up North River 19½ miles long, gives it a large trade from those important points, and this will be largely increased when the Valley Railroad is completed to the same places. A branch of this canal extends up the Rivanna river for some distance. The fine granite, gneiss, limestone, sandstone, slate and other quarries; the large deposits of iron ores of several kinds, including magnetite and hematite; the copper and gold of the "gold belt;" the cement, manganese, &c., found all along the line of this canal, where it is in operation, add much to its importance, and when the mineral wealth of the tributary country is exploited, as it

should and will be, its capacity will be taxed for transportation. The condition of the country it is yet to penetrate has been already given.

The fall* of this canal from Buchanan to mean tide level, at Richmond, is 812 feet; this gives a vast water power, utilized in some places, but offering great inducements for manufacturing enterprises. The fall at the tidewater connection is 84 feet in $1\frac{1}{2}$ miles. The terminal dock and basin at Richmond are extensive works, and much used in the transfer of cargoes to and from warehouses and between canal boats and vessels of all kinds here brought side by side.

The following extracts from the annual report of 1875 of Colonel C. S. Carrington, President of the James River and Kanawha Canal Company, to the stockholders, furnish much valuable information in regard to this important canal and the country tributary to it:

"In regard to your property, there are facts now known which furnish reliable data for calculation, and give unusual certainty for estimates of its value when the connection with Clifton Forge is completed. The cost of the canal to Buchanan and the work done, and cost of the same, west of that point, and the capacity of the canal for transportation, whether in the amount of freight which it can now carry, or after its improvement, at the small cost reported, or in the character of this transportation in its adaptation to the products of agriculture and to the largest development of a great mineral region, and also the character of the rail line to Clifton Forge and its comparative capacity for transportation from the west to that point and beyond, are all known with reasonable certainty. The value of the coal and of the iron ores on this line of water and rail are also now well known. The information about these minerals is so full and precise as to permit an intelligent consideration and decision of the results of their cheap transportation on this line.

"After the completion of the canal to Clifton Forge this line of transportation will be rail from the valley of the Mississippi to Clifton Forge, and by water from Clifton Forge to tidewater, or in a narrow view, by rail from the great Kanawha coal-field to Clifton Forge (94 miles from its eastern boundary, and 130 miles from the centre of this field), with a grade from the west against the coal not exceeding 20 feet to the mile, except 12 miles of 30 feet, and with an annual capacity for transportation to Clifton Forge of 2,000,000 tons, and less than 1,000,000 tons with the same power, east of Clifton Forge to tidewater, because of higher grades. From Clifton Forge to tidewater the transportation will be by canal with an annual capacity of 3,000,000 tons, and with rates of transportation lower than on other canals of like dimensions, because, first, the season of navigation will be longer, averaging not less than eleven months in the year; and, second, this canal will have the advantage of back freights.

"This extension will be the completion of 'the last span of the bridge' which will give value to the whole. Many of the elements of a great tonnage appear from a glance at the line and its location. Its low railroad grades, and water, and genial climate, and terminal facilities secure the lowest rates of transportation across the Alleghany mountains to tidewater. In its central connection of the productive west with tidewater, it will pass for 230 miles through the valley of the James river, which has a capacity for agricultural production as great as any portion of this country east of the Alleghany mountains, and which, with the valley of the Kanawha, contains mineral wealth greater in quantity, variety and value than can be found on any other line of transportation in this country.

"Within range of the Kanawha river, the quantity of available coal is so very large, that, practically, for one thousand years to come, it may be regarded as unlimited, and it can be mined at a cheaper rate than coals are mined in Europe or America. (Testimony of Professor Ansted before committee United States Senate.) Major-General Gillmore, United States corps of engineers, in his report to the Board of Engineers, says that, with proper carrying facilities,

* Report of President Carrington, 1874.

at least 10,000,000 tons of coal per annum would be at once drawn from the Kanawha coal-field. The Kanawha coals are better, purer, and more available for all the requirements of trade and manufacture, than the coals of any other portion of the Alleghany coal-field. (Professor Daddow.) The value of these coals in making iron and its manufactures, and as steam and gas coals, and for household purposes, is not a matter of speculation. They are used daily for all of these purposes, with an ever increasing demand for them. The New river coke, in the eastern portion of this coal-field and nearest to the iron ores of Virginia, is shown, both by analysis and experiment, to be better for making iron and for use in iron manufacture than either the Connelville coke or anthracite coal. By like experiment the New river coal is proved to be at least the equal of the Cumberland coal; as a steam coal, and for gas and household purposes, the Kanawha coals are superseding other coals within the range of their economical transportation.

"The canal from Clifton Forge (including the North river branch) passes through not less than 175 miles of iron territory. This iron belt extends to within 75 miles of Richmond; but consider it as limited to 100 miles on the canal, 50 miles west of the Blue Ridge and 50 miles east of Lynchburg. West of the Blue Ridge, the iron ores are the fossil and red and brown hematite ores. There is no question as to the great quantity of these ores or of their value. They have been worked for many years past, and produced first class iron. Some of the furnaces of this region were once famous for the excellence of their iron for cannon and other purposes requiring iron of great strength.

"The iron ores east of Lynchburg are the magnetic, specular and limonite or brown hematite ores. General St. John and Professors Smith and Mallet, of the University of Virginia, referring in their recent report to the veins of these ores, say: 'They succeed each other so closely and in such number, and they attain at single localities such very large absolute dimensions, that it is safe to say, without calculating upon future developments, that there is ore already uncovered and in outcrop comparable as to mass with the more favored localities of iron production in the United States.' The amount of metallic iron in 16 analyses of these ores was 56, 58, 43, 38, 66, 57, 64, 53, 57, 66, 45, 31, 50, 58, 65 and 63 per cent. These magnetic ores are practically free from phosphorus and sulphur. Only a small portion of them are titaniferous. In favor of the above analyses, where the metallic iron was 65, 57, 65 and 66, the titanac acid was .15, .12, .10, and in the fourth only a trace. These ores are very accessible to the canal. They are generally comprised within a distance of a few miles from its banks, with descending grades to the canal landings, thus reducing within moderate limits the items of transportation by wagon and tramway, so often embarrassing in furnace operations. Among many other favorable conditions for making iron at low cost on the canal may be mentioned the abundance of limestone, yielding, west of the Blue Ridge, from 95 to 97 per cent. of lime, and east of Lynchburg, from 75 to 80 per cent. Good sites for furnaces, with ample grounds, a healthy and productive country, abundant supplies of cheap lumber from West Virginia and from the line of the Lynchburg and Danville railroad, water power at the dams across James river, and the free, convenient and cheap transportation by water for the delivery of supplies and stock and removal of product.

"The estimates of experts of the cost of making iron on the canal after its completion to Clifton Forge have been from \$12.45 to \$19 per ton of 2,240 pounds. There is almost a concurrence of opinion with these parties, that iron will be made on the canal and delivered at tidewater at as low cost, and probably lower cost than elsewhere in this country. The prices of iron indicate the necessity of its production in this country at cheaper rates. Capital largely interested elsewhere in making iron is now employed in this field. Such capital may come more slowly, but it is improbable that the capital of the country will long neglect the advantages of making first-class iron on this line. The substitution of steel for iron is rapidly increasing throughout the world. The Bessemer process, chiefly in vogue for making steel, requires pig iron free from phosphorus. Ores of this character are very scarce east of Lake Superior, and the demand for Bessemer pig iron is greater than the supply. The magnetic ores on the canal have now for several years been subjected to a thorough investigation by parties

interested in making Bessemer pig iron. These investigations show that such iron can be made from these ores at a reduced cost. This fact, in connection with the position of these ores on the Atlantic seaboard, increases the probability of the rapid construction of furnaces on the line of the canal.

"There are now fifteen furnaces on the line of canal to Clifton Forge and in its vicinity. Those accessible to the Kanawha coals are in operation, and also some charcoal furnaces. All would be in blast if they could use the coals and cokes of Kanawha, and capital is reported as ready to build other furnaces as soon as it is assured of the extension of the canal to Clifton Forge.

"General St. John and Professors Smith and Mallet report 'that a single large blast furnace (of 65×16 feet) would, for the items of fuel, limestone, ore for admixture, product of pig iron and store supplies, demand an annual transportation of between 60,000 and 80,000 tons, and yet several of these furnaces are operated under single proprietorship in many of the old iron districts.' The annual product of such a furnace is 14,000 tons. The furnace at Quinnimont on New river, with an annual capacity of 10,000 to 12,000 tons, and situated at the coal bank, yields to the Chesapeake and Ohio Railroad a monthly revenue of some \$10,000. The fifteen furnaces on the canal and in its vicinity are each probably capable of an annual production on average of 2,800 tons, or together 42,000 tons, an amount equal to the production of three of these large furnaces.

"The Lake Superior ores are transported in large quantities to furnaces in the east and in the valley of the Mississippi. Experts in the east, familiar with this demand and with these canal ores, make very large estimates of their shipments eastward as a substitute for Lake Superior ores. These magnetic ores are now used in combination with hematite ores, in a furnace near Richmond, to the extent of one-half the charge, and 'the iron thus made is well known among experts to rank among the strongest and best brands of American production.' (Report of General St. John and Professors Smith and Mallet.) They will be carried to the hematite ores on the canal west of the Blue Ridge. * * * These ores will also be transported to the hematite ores on the line of the Chesapeake and Ohio Railroad and in the valley of the Ohio. If used in the same proportion as at the furnace near Richmond, every furnace of 14,000 tons will use 21,000 tons of these ores, and ten such furnaces, 210,000 tons, giving this amount of back freight to the canal, and an additional annual revenue of more than \$70,000 at a toll rate of 3 mills per ton per mile.

"The granite, slate, cement and lime of the valley of James river are without practical limit in quantity, and of superior quality. The granite and slate have been sent to St. Louis, via New Orleans, by water and by rail, and their successful competition in that distant market was only prevented by their long transportation.

"The lime is made by one firm in Botetourt county to the extent of 50,000 barrels annually, and is being introduced into many of the Southern States, and the cement is used in Kentucky, and has been chosen for a lock to be constructed by the general government on the Kanawha river.

"The canal and railroad will be the line of transportation to and from the west for Lynchburg, 82 miles east of Clifton Forge. This city will be a distributing point for Kanawha coal to the railroads centring there and to the country south and southwest penetrated by them. It is one of the largest and most prosperous tobacco markets of the State, and situated in the centre of the iron district on the canal, and with cheap coal from Kanawha, will become a great centre of iron manufacture."

The canal from Alexandria to Georgetown connects with the CHESAPEAKE AND OHIO CANAL, of Maryland, in which Virginia has an interest. This canal is valuable as an outlet to all portions of the State bordering on the Potomac above Alexandria. It brings to that city a large tonnage of coal from the celebrated Cumberland mines.

The ROANOKE NAVIGATION COMPANY has improved the navigation of portions of the Roanoke river and of its branch, the Dan, giving water transit from Danville down through an important and highly productive country.

SECTION II.—TRANSPORTATION BY TIDAL WAYS.

Few regions of equal size are as well provided by the beneficent Creator with natural highways for trade and transportation as Tidewater Virginia. Navigable bays, rivers, creeks, &c., penetrate and permeate every portion of it—so much so that there is *a mile of tidal shore* to every *six square miles* of territory.

CHESAPEAKE BAY, lying within the domain of Virginia for over 70 miles of the 200 of its length, where its width is from 14 to 30 miles, is unsurpassed, as a great inland sea of diversified outline, for commercial purposes; it is not subject to violent storms; there are harbors all along its shores, none of which are rock bound or dangerous; its waters are deep and free from obstructions; a vessel bound up it, and following the "sailing directions," once fairly inside the "Capes of Virginia" runs on an air-line of north $\frac{1}{4}^{\circ}$ east for over 50 miles. Into this bay flow the waters of 50,000 square miles of productive country. It is rapidly becoming the "Mediterranean" for the outgoing and incoming commerce of the great Central Belt of American states, which here find an easy exit and entrance to and from the great ocean highways. This is the refuge for ships on all the middle coast from stress of weather.

The following table, from the United States Coast Survey Report for 1857, shows the character of the channels from the Bay to some of the harbors and anchorages of Virginia, and proves their advantages as ports for the largest class of vessels, especially as they are *never obstructed by ice*:

	LEAST WATER IN CHANNEL WAY.			
	MEAN TIDES.		SPRING TIDES.	
	Low Water. Feet.	High Water. Feet.	Low Water. Feet.	High Water. Feet.
Between the Capes at entrance to Hampton Roads,	30.	32.5	29.8	32.8
Anchorage in Hampton Roads.....	59.	61.5	58.8	61.8
From Hampton Roads to Sewall's Point.....	25.	27.5	24.8	27.8
South of Sewall's Point $1\frac{1}{2}$ miles.....	21.	23.5	20.8	23.8
Up to Norfolk.....	23.	25.5	22.8	25.8
From Hampton Roads to James River, entering } north of Newport News Middle ground..... }	22.	24.5	21.7	24.8
Same—entering south of above.....	27.	29.5	26.7	29.8
York River from abreast the tail of York Spit up } to Yorktown..... }	33.	35.5	32.7	35.8
Elizabeth River between Norfolk and the Navy } Yard..... }	25.5	28.	25.3	28.3

The POTOMAC RIVER is navigable for 110 miles above its entrance into Chesapeake Bay, 100 miles from the ocean. The head of navigation is Georgetown, in

the Federal District. Washington, the Capital of the United States, is 2 miles lower down, and Alexandria, a flourishing Virginia city and port, is seven miles farther. These three cities are connected by canal, steam ferries and railway, and from them lines of steamers and sailing vessels of all kinds run to the numerous landings on the Potomac and the towns and cities of the bay and its tributaries; they also have a considerable coastwise and some foreign trade. Numerous lines of railways converge to these cities from all directions.

Alexandria is the terminus of the Alexandria and Washington Railway, giving connections to all points North and West; the Washington and Ohio, running through the fine Piedmont country and yet to run to the Ohio; the Washington City, Virginia Midland and Great Southern, part of the great South and Southwest system of railways; the Alexandria and Potomac, connecting with the South; the Baltimore and Ohio, with its numerous connections, runs to the opposite bank of the Potomac, and its cars are ferried across. There are numerous landings along the Potomac, giving great facilities for the shipment of produce and for communication with the extensive and excellent country, abounding in fine grain and fruit farms, along its shores. Alexandria and Georgetown are Ports of Entry.

The RAPPAHANNOCK is navigable to Fredericksburg, 92 miles from Chesapeake Bay, for steamers and sailing vessels drawing 8* feet. At Fredericksburg it is crossed by the great north and south line of railways from Baltimore and Washington to Richmond, and meets a nearly completed one from Gordonsville that will connect with the Chesapeake and Ohio and the Virginia Midland—most important lines, the trade from which will greatly benefit the city in question. The river was once improved above Fredericksburg, by locks and dams, as a canal; these are now used for water power. Port Royal, 22 miles below Fredericksburg, is a point to which vessels of larger draught can come; it is the port of a very fertile section. Tappahannock, the Port of Entry for the river, is 60 miles below Fredericksburg; vessels drawing 11½ feet can ascend to that place. Urbana is also an important port. Besides the places named, there are numerous landings on both banks, where the lines of steamers that run regularly from Fredericksburg to Baltimore stop for freight and passengers. The valley of the Rappahannock is a productive one, and its trade employs a good many sailing vessels.

The PIANKETANK is navigable for some 14 miles.

MOBJACK BAY and its tributary rivers give deep entrances to the fine Gloucester peninsula.

YORK river is a wide, deep and almost straight *belt* of water-reach over 40 miles long from the Bay to the junction of Pamunkey and Mattapony rivers, that form it, at West Point; those rivers are also navigable many miles for light draught vessels. Ships drawing 13 feet can go to West Point at all times, while the depth is 27 feet up to within a short distance. The Richmond, York River and Chesapeake Railroad connects West Point with Richmond and a daily line of steamers with Baltimore. There are numerous landings on the York, at which the steamers stop; the most important of these is Yorktown, the county town of York county, which

*United States Engineer's Report, 1871. It is proposed to deepen the channel to 10 feet, and appropriations have been made for the work.

has been selected as one of the deep water termini of the Chesapeake and Ohio Railroad—which is to be extended down The Peninsula by Williamsburg, the seat of William and Mary College. Yorktown is 16 miles* from the Bay.

There is a line of steamers from Yorktown to and from Norfolk, by way of Cherrystone, the Port of Entry for the Eastern shore peninsula, and Mathews Courthouse; and the daily line to and from Baltimore touches here in going to and from West Point.

The MATTAPONY is navigable some 30 miles above the York to Aylett's and the PAMUNKEY 35 miles to Oyster Shell Landing. The valley of the York is celebrated for its fertility, and the river itself for its oysters and fish.

JAMES RIVER is navigable 110 miles, for vessels drawing 14 feet of water, to Richmond, the Capital of Virginia and a Port of Entry with a Custom House, where, at the head of its tides, it is crossed by the numerous lines of railway that radiate in all directions from that flourishing city. The navigation of the James is extended for 198 miles beyond Richmond by the water line of the James River and Kanawha Canal. Vessels drawing 15 feet can ascend at all times to City Point, 60 miles below Richmond, at the mouth of the Appomattox. It has at all times 30 feet of water and at high tide $32\frac{1}{2}$ at its entrance, and Hampton Roads, the magnificent expansion of its mouth, has from 59 to 62 feet of depth in its anchorage, which is ample enough to float the marine of the world in its land-locked and well-defended limits. Numerous lines of steamers and sailing vessels run regularly to and from Richmond, touching at numerous landings on the James, connecting it directly with Norfolk, Baltimore, Philadelphia, New York and other places. Seventy-seven merchant ships belonged to the Richmond District in 1871. The James is acknowledged to be one of the finest navigable rivers of the Atlantic slope, and the fine lands—farming, planting, trucking forest, &c.—along it have great advantages in transportation at low rates. The branches of the James are the APPOMATTOX, navigable from City Point, 12 miles, to Petersburg, a thriving city, where lines of railway connect in all directions (one line to the deeper water at City Point); the CHICKAHOMINY, navigable for small steamers and vessels for many miles; PAGAN CREEK, a fine stream navigable to Smithfield; NANSEMOND river, navigable 15 miles to Suffolk and the railroads there—its lower reach a broad and deep estuary; ELIZABETH river, the noble stream on which the thriving seaport cities of Norfolk, Portsmouth and Gosport are situated, navigable 12 miles or more, with from 23 to 28 feet of water, and extended by ship canals to the bays of North Carolina. Eight miles from the James the Elizabeth expands into the noble harbor of Norfolk and Portsmouth, in which the depth of water is from 25.5 to 28.3 feet.

Norfolk and Portsmouth had, in 1871, belonging to their district, 335 merchant vessels. From these cities there is a *daily* line of steamers to Baltimore; another to Washington City and landings on the Potomac; another to Richmond and landings on the James; also regular steamers to Cherrystone, Mathews Courthouse and Yorktown; to Hampton and Fortress Monroe; by ship canal to Roanoke Island, Washington and Murfreesboro', North Carolina; to Boston, to Philadelphia and to New York, and to Liverpool, England. They have, besides, lines of sailing vessels

* English statute miles are the only ones used in this Summary.

of various kinds running not only to all parts of Tidewater Virginia, of which Norfolk is the commercial capital, but also to all portions of the trading world.

Norfolk, by the completion of railway connections and other transportation routes, is vindicating, by results, the advantages she possesses for commercial operations. In* 1858 this city received 6,174 bales of cotton; in 1873-'4 she received 467,561, and became the third cotton port of the United States (not far below Savannah, the second). In 1866 Norfolk exported to Europe but 733 bales; in 1873-'4 the export was 20,346 and for the first quarter of 1874-'5 it was 40,799 bales sent direct to Europe.

Hampton, the seat of the flourishing Hampton Normal and Agricultural Institute, and Newport's News, near the end of "The Peninsula," are on the splendid roadstead of Hampton Roads. The Chesapeake and Ohio Railway will no doubt have one of its deep water termini near these places, when they will become great shipping points.

There are numerous other navigable streams in Tidewater Virginia; and it may be again repeated that every portion of it is accessible, at all seasons, to craft of some description, and that from no section of the United States can the productions of the country be more readily and cheaply sent to market.

* Report of President Mahone to State, 1874.

CHAPTER XI.

THE FORM OF GOVERNMENT OF VIRGINIA.

The State of Virginia is an independent Republic, except in regard to powers which she, in common with the other states of the Union, has conferred upon the General Government of the United States for the common defence and general welfare of all the states, by a written constitution.

All the powers not expressly given to the Government of the Union are reserved to the states, and each one of these is independent in the exercise of these reserved powers.

The principle that underlies the foundation of the government of Virginia (as well as of all the different states of the Union and of the Union itself) is, that *Government is of the People and for the People*; is instituted for their common benefit, security and protection, and that they, or a majority of them, have a perfect right to frame, change or abolish it as they may judge most conducive to the public welfare.

The form adopted (and that has been most successfully and satisfactorily administered for a hundred years, 1876), is Republican; one in which the sovereign power is exercised by delegates and officers *elected* by the people, subject to the provisions and limitations of a written constitution, which has been adopted by the people as the organic law of the land.

The constitution of the State is prefaced by a "Bill of Rights," which sets forth the rights of the people, the State and the General Government. This Declaration is made part of the organic law. It declares "that all men are by nature equally free and independent;" "that they have inherent rights for the enjoyment of life and liberty," for "acquiring and possessing of property," and for "pursuing and obtaining happiness and safety." That the State is a member of the United States of America, and its people part of the American nation. That the constitution of the United States and the laws passed in pursuance of it are the *supreme* law of the land. That all power is vested in and derived from the people, and magistrates are their servants and trustees, and always amenable to them. That exclusive privileges belong to no man or set of men, and that no offices are hereditary. That the object of government is the common good of all, and that form is best that produces the greatest happiness and safety and is best secured against mal-administration. That the people have a *perfect* right to reform or abolish the form of government, as they shall judge best for the public welfare. That the legislative, executive and judicial powers should be kept separate, and that at fixed periods all officers

should be remanded to private station, so they may feel and share the burthens of the people—all vacancies to be filled by “frequent, certain and regular elections.” That all elections ought to be free, and all men having an interest in the community should have the right of suffrage, and cannot be taxed or bound by any law without their personal or representative consent, expressed at a popular election—the will of the majority governing.

That laws, or their execution, should not be suspended but by consent of the people’s representatives. That in all criminal prosecutions a man may demand the cause and nature of charges made against him; that he shall be confronted by his accusers and witnesses; may call for witnesses in his favor; shall have a speedy trial by an impartial jury of his vicinage, “without whose unanimous consent he cannot be found guilty;” that he cannot be compelled to give evidence against himself, or be deprived of liberty but by law or the judgment of his peers. That excessive bail shall not be required, excessive fines imposed or cruel or unusual punishment inflicted. That general warrants of search shall not be granted on suspicion merely, without evidence of deeds done, or persons seized, unless by name and offence described and supported by evidence. That trial by jury is preferable in controversies about property and in suits between man and man, and should be held sacred. That the freedom of the press cannot be restrained or the right of any citizen to speak, write or publish his sentiments on all subjects—being responsible for the abuse of that liberty. That the body of the people trained to arms are the proper and safe defence of a free state. That standing armies, in peace, should be avoided, and that the military should always be subordinate to the civil power. That the people have a right to a uniform government, and that none independent of that of Virginia should be set up within her limits. That free governments can only be preserved by a “firm adherence to justice, moderation, temperance and virtue, and by a frequent recurrence to fundamental principles.” That there should be perfect toleration in matters of religion, all men being free to follow the dictates of conscience, at the same time recognizing the duty of mutual forbearance. That there shall be no involuntary servitude, except as imprisonment for crime. That all citizens of the State possess equal civil and political rights and public privileges. And finally, that the enumeration of rights does not limit other rights of the people because not enumerated.

The Government of the State is entrusted to three departments—the LEGISLATIVE, the EXECUTIVE and the JUDICIAL, each with distinct and separate powers and officers.

LEGISLATIVE.

The LEGISLATIVE, or Law-making, power of the State is vested in a GENERAL ASSEMBLY, consisting of two bodies—a Senate and a House of Delegates.

The HOUSE OF DELEGATES consists of 132 members, apportioned among the cities and counties of the Commonwealth, in proportion to population; elected to serve for two years, the election being held for the whole State every two years, on the Tuesday after the first Monday in November.

The SENATE consists of 43 members, the whole State being divided into that many districts (embracing cities, towns and counties), as nearly equal in population.

as may be. The districts are numbered, and those having even numbers elect biennially a senator for four years at one of the elections above mentioned, and those bearing odd numbers at the next succeeding election, so that although all the senators are elected for four years, one-half of them go out of office every two years. The State is districted anew after each decennial census of the United States for senatorial and delegate districts.

Any person resident in the district, and a qualified voter for members of the Senate or House of Delegates, may be elected a member of either body; he must continue a resident while he represents.

The Senate is presided over by the Lieutenant-Governor of the State, or, in his absence, by a President *pro tempore*; the House of Delegates is presided over by a Speaker elected by the body from among its own members.

Bills and resolutions may originate in either house, to be approved or rejected by the other. In order that any bill may become a law, it must have passed the Senate and House of Delegates and be approved by the Governor of the State. If the Governor does not approve of the proposed law he returns it, with his objections, and it can only become a law then by having two-thirds of the members of each house agree to it by a recorded vote. No bill can become a law until it has been read on three different days in the house in which it originated, unless two-thirds of the members determine otherwise. Each house is required to keep a journal of its proceedings and publish the same from time to time. No law can embrace more than one object. The House of Delegates alone has the power to prosecute for impeachment, and the Senate the power to try such cases.

The General Assembly is forbidden the power to legislate in a number of cases—in that it cannot pass a bill of attainder, an *ex post facto* law, a law impairing the obligation of contracts, one taking private property for public use without just compensation, one abridging the freedom of speech or of the press. It cannot compel any one to frequent or support any religious worship or molest him in any way on account of his religious belief; nor can matters of religion in any way affect one's civil capacities. The General Assembly cannot prescribe any religious test, confer any peculiar privileges on any sect, or authorize any society or the people of any district to levy on themselves or others a tax for any church purposes, leaving each one free to select his own religious instructor as he may please and provide for him by private contract. It cannot grant a charter of incorporation to any church or sect, but can secure the title to church property to a limited extent. The General Assembly has no power to establish a lottery, or to form new counties except under restriction; and it must confer upon the courts the power to grant divorces, change names, direct sales of estates of infants, &c., avoiding special legislation where courts, &c., have jurisdiction. The manner of conducting elections, making returns, filling vacancies in office, &c., is provided for by law.

EXECUTIVE.

The *Executive* power is vested in a Governor, elected for four years, and ineligible for the next four years after his term of service expires. The people choose the Governor at the election in November, before mentioned; he must be a citizen of the United States, and if foreign born, must have been one for ten years; must

be 30 years old, and have been a resident of the State 3 years preceding his election. The Governor must reside at the seat of government. His duties are to take care that the laws are faithfully executed; communicate to the General Assembly at every session the condition of the Commonwealth; recommend such measures for their consideration as he may deem expedient; call extra sessions of the General Assembly when he shall consider that the interests of the Commonwealth demand it, or when requested to do so by two-thirds of the members. He is Commander-in-Chief of the land and naval forces of the State, and has power to embody the militia to repel invasion, suppress insurrection and enforce the laws, &c. The Governor holds intercourse with other and foreign states; fills vacancies in offices when not otherwise provided for; he has also the pardoning power, the granting of reprieves, remission of fines, &c., under provisions of law. He attests the commissions and grants of the State, and has a veto upon the acts of the General Assembly, as before recited.

A Lieutenant-Governor is elected at the same time and for the same term as the Governor and having the same qualifications; he is President of the Senate, having a vote only in case of an equal division. In the event of the removal from office, death, &c., of the Governor, he becomes the Executive of the State.

A *Secretary of the Commonwealth*, a *Treasurer* and an *Auditor of public accounts* are elected every two years, by the General Assembly, to discharge the duties pertaining to such offices, and in addition, there may be established in the office of the Secretary of State a bureau of agricultural chemistry and geology. Power is also granted to the General Assembly to establish a bureau of agriculture and immigration.

A *Board of Public Works*, composed of the Governor, Auditor and Treasurer, is provided, having charge of the Internal Improvement interests of the State.

A *Board of Education*, composed of the Governor, Superintendent of Public Instruction and Attorney General, has charge of the Public School System of the State; the *Superintendent of Public Instruction*, the Executive of this Board, is elected by the General Assembly, and holds office for four years.

A *Board of Immigration*, consisting of the Governor, the Speaker of the House of Delegates, the Secretary of the Commonwealth, the Auditor and the Treasurer, is charged with certain duties in collecting and disseminating information about the State.

JUDICIARY DEPARTMENT.

There are provided a *Supreme Court of Appeals*, consisting of five judges; *Circuit Courts*, of which there are sixteen judges, the State being divided into that many judicial districts; and *County Courts*, presided over by judges—one for each of the counties of the State (except that counties with less than 8,000 inhabitants are attached to adjoining counties).

The *Judges of the Court of Appeals* are chosen by the General Assembly for a term of twelve years; they must have held judicial position or have practiced law for five years in the United States when chosen. This court is one of "appeal" only, except in cases of *habeas corpus*, *mandamus* and prohibition. It can only consider civil cases where the matter involved has a value of \$500 or more, except in

controversies concerning the title or boundaries of land; the probate of a will; the appointment, &c., of a guardian, committee, &c.; or concerning a mill, roadway, ferry or landing; the right of a corporation or county to levy taxes or tolls.

This court decides the constitutionality of laws; but it requires the assent of a majority of all the judges elected to the court to declare any law null and void because of its repugnance to the constitution of the State or that of the United States. This court must state the reasons for its decisions, in writing, to be filed with the records of the case. The Court of Appeals meets annually at Richmond, Staunton, Wytheville and Winchester, appeals from certain portions of the State being made to the court when sitting at either of these places.

An Attorney-General is elected, at every election of Governor, by the qualified voters of the State. He is the representative attorney for the State in all cases in which the Commonwealth is a party.

The *Judges* of the *Circuit Courts* are chosen by the General Assembly for eight years; they must have the same qualifications as the judges of the Court of Appeals, and must reside in the districts for which they are judges. Three terms of the Circuit Court are held yearly in each county. Courts of the same grade are also provided for the cities and towns having over 5,000 inhabitants. These courts have general jurisdiction in all matters of law and chancery, but appeals may be taken from their decisions, with certain limitations, to the Supreme Court of Appeals. They are also courts of appeal from the decision of the County Courts. The judges of the Circuit Courts are authorized to grant charters and incorporate companies for any purpose, except the construction of a canal or railway, under legal restrictions.

The *Judges* of the *County Courts* are chosen by the General Assembly for a term of six years. They must be "men learned in the law of the State." The jurisdiction of this court is such as may be by law provided; its powers are, at this time, 1873, limited, making it a court of probate and giving it jurisdiction of all presentments, informations and indictments for misdemeanors; it has power in all matters specially referred to it by statute. Terms of this court are held every month. This court has charge of the clerk's offices, in which deeds, contracts, &c., are recorded.

The voters of each county elect every three years a Sheriff, County Treasurer and Commonwealth's Attorney and a Superintendent of the Poor, and every six years a County Clerk (and in counties having over 15,000 inhabitants a separate Circuit Court Clerk). These are officers of both the County and Circuit Courts.

The counties of the State are divided into districts, not less than three in any county, in which are elected, biennially, a Supervisor and an Overseer of the Poor. These hold office for two years. They also elect, biennially, three Justices of the Peace and three Constables for a term of three years—there being three of these officers in each district. A Commissioner of the Revenue is elected for four years.

The Supervisors of each township form a County Board that audits the accounts of the county, examines the books of the assessors, regulates and equalizes the valuation of property for purposes of taxation, fixes and apportions the county levy, &c.

There are also School Districts in each township. (The details of the School System have been given under the head of Education).

Each district is divided into Road Districts, each in charge of an Overseer of Roads appointed by the County Court, under whose direction the roads of that district are kept in repair at the public expense.

Cities and towns are provided with separate governments suited to their wants, having a mayor, a council, special courts, &c.

MILITIA.

All able-bodied males between 18 and 45, except those exempted by law, form the militia of the State, and the General Assembly has power to arm, equip and train them by provisions of law; the militia are simply enrolled as a reserve, and perform no service of any kind in time of peace, being only liable to service in times of danger. There are volunteer military companies, to which the State grants special privileges. The volunteers constitute the active militia.

TAXATION AND FINANCE.

Taxation of all kinds must be equal and uniform, and all property is taxed in equal proportion to its value, ascertained as prescribed by law, *except* that no tax can be imposed on citizens of the State for the privilege of taking oysters, with tongs, from their natural beds, but the sales of such oysters may be taxed in proportion to their value; property used exclusively for state, city or county, religious, educational, charitable, and such like purposes, may be exempted; incomes in excess of \$600 a year may be taxed; licenses for selling liquors, for shows, &c., and all business that cannot be reached by an *ad valorem* system, may be taxed specially; capital invested is taxed as other property; stocks are assessed at market value; a capitation tax, not exceeding one dollar per annum, can be levied on all males 21 and over for public school purposes, and corporations and counties are limited to a capitation tax that shall not exceed 50 cents a year for all purposes. The lands in the State are valued every five years by properly appointed assessors, and provisions are made to secure a fair valuation. The State cannot contract a debt except to meet casual deficits in the revenue, pay former liabilities, or for the defence of the State, and every law creating a debt must provide for its payment by a sinking fund; so also a sinking fund is provided to pay past indebtedness. The same bonds of the State are everywhere to bear the same rate of interest, and the bonds are to bear, in redemption, a value not exceeding that established for them by law when issued. No money can be paid from the treasury of the State except it has been appropriated by law, and the prohibition is positive against the payment of any debt created for aiding rebellion against the State or General Government. It requires a majority of all the members of each house of the General Assembly to make an appropriation, and the ayes and noes of the vote must be recorded.

The credit of the State cannot be granted in aid of any person, association or corporation; and no bonds, &c., can be given by which the State may become indebted except to pay former debts or as permitted by the constitution. The State cannot become a party in any company, interested in or carry on any work of internal improvement, except in the expenditure of grants made to it for such purposes.

Every law imposing a tax must state what the tax is for. The State is forbidden to pay the debts of counties, boroughs or cities, or to lend them its credit; and it must publish with its laws, every year, an accurate statement of receipts and expenditures of the public money and of the State's indebtedness. The taxes must be limited to an amount necessary for the expenses of the State and to pay its indebtedness. The State is forbidden to release any incorporated company or institution from the payment of money due to the State.

HOMESTEAD AND OTHER EXEMPTIONS.

Every householder or head of a family can hold a homestead, valued at not over \$2,000, free from seizure for debt, &c., except for the purchase money of the property; the services of a laboring man or mechanic; for liabilities as a public officer, fiduciary, &c.; for taxes, legal fees, for rents, or for mortgage, &c., on the same. By law many household articles are also exempt from seizure. The laws in relation to homesteads must be construed liberally.

The passage of any law staying the collection of debts is prohibited. The rights of ecclesiastical bodies to property, conveyed to them according to law, are guaranteed.

To make any changes in the constitution it is necessary for two successive General Assemblies to agree to the amendments proposed and then for the voters of the State to assent.

All the provisions of government and law that have been mentioned are constitutional—therefore of permanent and binding force upon the government and people of the State until changed as just stated or by a convention that may be called by a vote of the electors of the State in 1888, or any 20th year thereafter; so there can be no sudden changes of the organic law.

All the laws of the State are obliged to conform to these general provisions, and any one having a good idea of these foundation principles may readily understand what the body of the laws of the State, or the Code, must be.

LAWS OF GENERAL INTEREST.

There are some provisions of law that a stranger to the State would wish to have the salient features of more in detail; some such are selected from the "Code of 1873."

CITIZENS of the State are: all persons born in the State; all persons born in other states of the United States that become residents of the State; all aliens naturalized under the laws of the United States that become residents of the State; all persons that have by law acquired citizenship; all children, wherever born, whose father, or if he be dead, whose mother, is a citizen of the State at the time of such birth.

CITIZENSHIP MAY BE RELINQUISHED by deed or declaration to a court of record where the person desiring to relinquish resides, if the party leaves the country; or when a person 21 years of age voluntarily becomes a citizen of another state he loses his citizenship in this; only this cannot be done as to a foreign state during a war with any foreign power.

IMMIGRANTS MAY MAKE CONTRACTS in a foreign country, for not less than two years, for labor in this State, and have them attested before a United States Consul or commercial agent at the port where such immigrant shall embark, and the same can

be fully enforced in Virginia. The contract must be made in duplicate—the original in the vernacular of the immigrant, which he holds, and which binds him; the copy must be in English, and recorded by the employer in the County Court clerk's office within 10 days after the arrival of the immigrant, to make it binding on him. The immigrant may require security for the payment of his wages by application to a Justice of the Peace, and if discharged without good and sufficient cause, may recover what is due for past services and damages not exceeding three months' wages; and if the person employed leaves his employer without cause he becomes liable for an amount equal to three months' wages.

The State has made provision for publication, setting forth its resources, advantages, &c., and inviting the population of other states to settle and capitalists and manufacturers to invest and erect establishments in the State. The Board of Immigration—the Governor being its President—has charge of this.

ALIENS MAY HOLD REAL ESTATE IN VIRGINIA under the following law, viz: "Any alien, not an enemy, may acquire by purchase or descent and hold real estate in this State; and the same shall be transmitted in the same manner as real estate held by citizens." It is also provided that "Alienage in any person claiming a distributive share of the personal estate shall be no impediment to his receiving the same share that he would have been entitled to if he had been a citizen;" and again, "In making title by descent, it shall be no bar to a party that any ancestor (whether living or dead), through whom he derives his descent from the intestate, is or hath been an alien." An alien may also purchase, transfer or locate land warrants, provided he within two years becomes a citizen or transfers his rights to a citizen.

The State of Virginia is divided into nine Congressional districts, from each of which is biennially elected by the voters a member of the House of Representatives of the United States. Every four years the General Assembly elects a member of the Senate of the United States, to be one of the two representing the State of Virginia in that body.

The QUALIFICATIONS OF A VOTER in Virginia are: that he shall be a male citizen of the United States, 21 years old, who has been a resident of Virginia for one year, and of the county, city or town where he offers to vote for three months next preceding any election and is a registered voter and resident in the election district in which he offers to vote. No soldier, sailor or officer of the United States army or navy is made a resident by being stationed in the State. The following are also excluded from voting, viz: idiots, lunatics, persons convicted of bribery in any election, embezzlement of public funds, treason or felony, or any one that, while a citizen of the State, has since July 6th, 1869, fought a duel or in any way assisted in fighting one.

Every precaution has been taken by provisions of law, with penalties, to secure perfectly fair elections and give to every voter an opportunity to express his preference. No intoxicating liquors are allowed to be sold or distributed from sunset of the day before to sunrise of the day after any election in a county, corporation or district, under a penalty of a fine of \$1,000 and imprisonment for a year. Voting is by secret ballot.

No one can hold office in Virginia that, being a citizen, has been engaged in a duel since 26th of January, 1870, or that holds any office of any kind under or has

any emolument from the United States Government, except that members of Congress may act as justices, as visitors of the University and Military Institute, or as militia officers; nor does it apply to pensioners on account of wounds received in war, or those recompensed for military service. No one convicted of felony can hold office; nor can any one that buys or sells or proposes to farm out an office, in whole or in part, *except the sheriffalty*.

The Common Law of England, when not repugnant to the Bill of Rights and the Constitution of the State, is in full force and is the rule of decision, unless altered by law; and the same is true of all writs, remedial and judicial, of a general nature, made in aid of the common law of England prior to the reign of James the First.

The Justices of the Peace have concurrent jurisdiction with the County and Corporation Courts of all petit larcenies, and in cases of assault and battery not felonious; they are general conservators of the peace and may adjudicate any claim for damages where the amount claimed does not exceed \$20. An appeal can be taken from the justice's decisions to the county or corporation court.

The overseers of the poor are required to arrest all vagrants and beggars and take them to the poor-house, and compel those that are able to work; it is the duty of the same officer to provide for the destitute on proper application and proof of want.

Ample provisions are made for chartering companies of all kinds and giving to them such privileges as are needful for the proper transaction of any business they may carry on, the State especially desiring to foster and encourage all productive industries and all institutions that promote those industries.

Provision is made by law for the preservation of the public health.

To secure a proper care of tobacco, one of the important staples of the State, provision is made for the erection of warehouses, in which tobacco can be safely stored, and where it can be exposed for sale. Two inspectors are annually appointed for each of these warehouses, one by the Governor of the State and one by the owners of the warehouse, whose duty it is to examine and decide the condition, quality, &c., of all tobacco brought to be inspected, and certify the same to the owner. Tobacco unmanufactured cannot be exported until it has been inspected, nor can tobacco be conveyed in a boat from one part of the State to another except in hogsheads or casks. These provisions do not apply to Alexandria county. A penalty is attached to the use of false brands on manufactured tobacco.

Provision is made for the inspection of flour, corn meal, bread, fish, pork, beef, pitch, tar, turpentine, salt, lumber, hemp, butter, lard, &c., to the end that the brand on the same, or that which contains them, may indicate the quality and quantity of the article exposed for sale or shipped from the State, thus giving the seal of authority to the good article and condemning the bad.

Weights and measures must conform to the standards provided by the State.

Live stock sold by weight for the shambles at Richmond must be weighed at the public scales by the weigh-master.

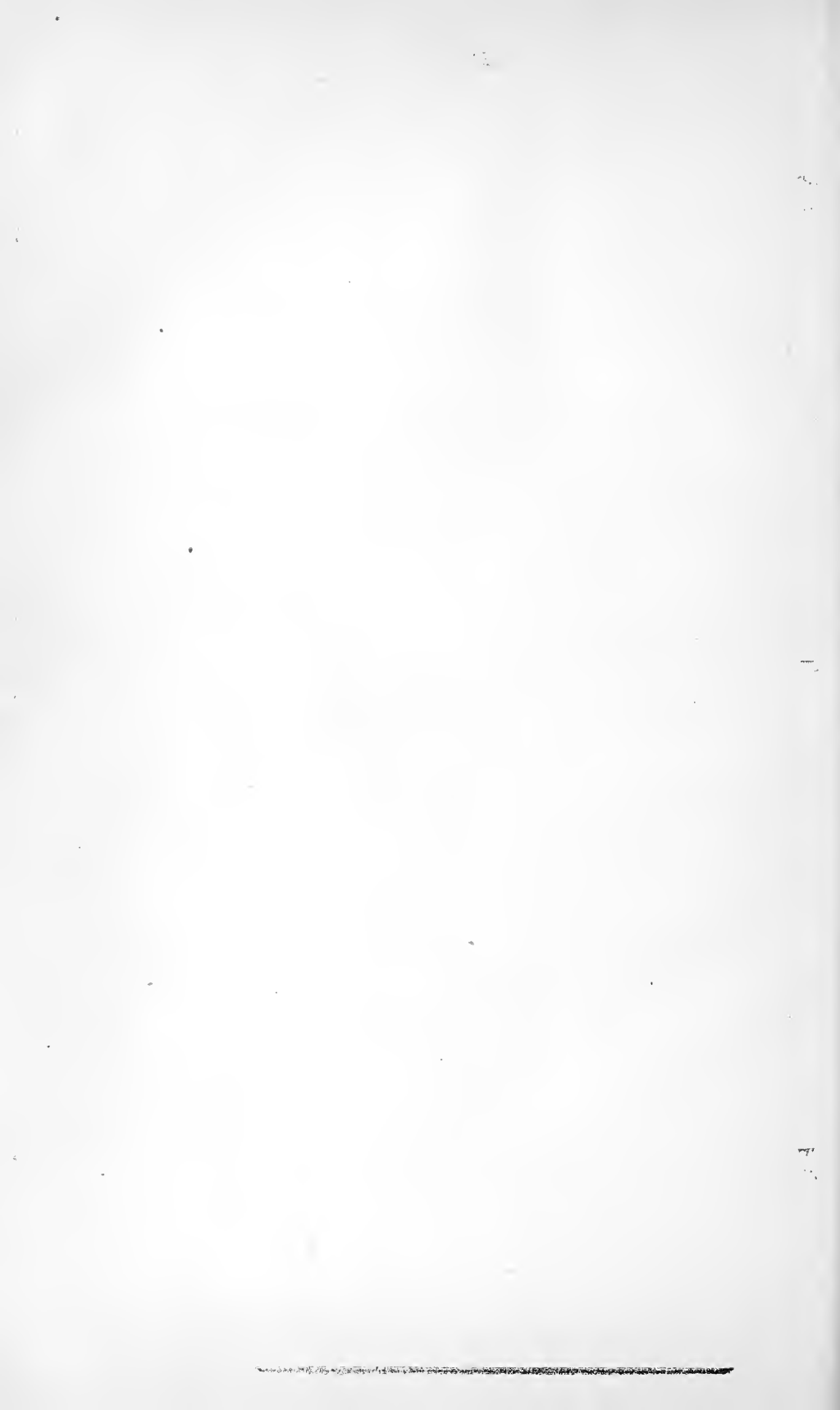
Commissioners of wrecks are appointed for the counties on the sea or bay shore, who are charged with assisting vessels threatened with shipwreck and caring for those that may be wrecked. The State also sees that those acting as pilots in her

navigable waters are properly qualified, and her commission is a guarantee of fitness. Ballast must be discharged under the direction of the ballast-master of the county or corporation where the discharge is made. The usual regulations for seaports and officers to enforce them are provided for by law. No one can obstruct a highway, and vehicles meeting must bear to the right, so each can pass safely. Lawful fences are those that are five feet high; but numerous rivers in the State are by law declared lawful fences. The owners of stock are liable to fine and damages whenever such stock shall enter grounds enclosed by a lawful fence. Provision is made by which counties may adopt a "fence law," which requires the owners of stock to keep such stock from running at large, and so does away with the necessity for fences. Some counties have adopted this law.

To preserve deer it is required by law that no one shall run them with dogs or kill them between the 15th of January and the 15th of the following July. A fine is imposed upon any one that hunts or shoots upon the enclosed lands of another without his consent, and for a second offence and conviction security may be required for good behavior for a year, and if not given the offender may be sent to jail for a month, unless the security is sooner given; and still more stringent laws are in force in parts of Fairfax, Stafford and King George counties. It is left discretionary with counties to adopt the more stringent laws that apply to hunting, shooting, &c., in a town or village, in the streets or lots of the same.

The State claims jurisdiction all over tide waters, and reserves the fishing and hunting of the same for its own residents. Wild fowl can only be shot or killed from the land during the night, and in some counties at no time from a boat, unless the marsh belongs to the one shooting or he is shooting for game for his own use, on the Potomac, below Alexandria county. In some counties it is unlawful to kill partridges, pheasants, woodcock or wild turkeys from the 1st of February to the 1st of October in any year; and any county may adopt the regulation. Fishing at certain seasons and places, and in certain ways, is also prohibited, in order that the growth of fish may be protected; and non-residents are not allowed to take fish to convert into oil or manure. The fishing season for shad and herrings in the waters of the Potomac begins the 1st day of March and ends the 1st day of June each year. The owners of dams are required in some counties to provide for the passage of fish over the same.

There are many provisions of law in relation to the taking of oysters, since they rank among the most valuable and important products of the State. The bays, rivers, creeks, &c., of the State, where no grants have been made by law, are considered the property of the State, and all the people of the State are privileged, under regulations, to fish, fowl, take oysters or other shell fish from them. But where waters are included in estates they belong to them, as do also their products; and where parties desire to plant oysters they can secure the right.



APPENDIX A.

RAILROADS, CANALS, &c.

ATLANTIC, MISSISSIPPI AND OHIO RAILROAD* (A. M. & O.)

STATIONS.	Miles between Stations.	Miles from Norfolk.	Feet above Tide.	STATIONS.	Miles between Stations.	Miles from Norfolk.	Feet above Tide.
Norfolk.....	.....	.....	.....	Appomattox.....	6.	181.	834.5
Tucker's.....	10.50	10.50	.....	Spout Spring.....	5.	186.	847.6
Suffolk.....	12.50	23.	58.0	Concord.....	5.	191.	833.1
Windsor.....	11.	34.	84.9	Lynchburg.....	13.	204.	515.3
Zuni.....	7.	41.	27.6	Halsey's.....	3.75	207.75	.....
Ivor.....	4.	45.	87.4	Clay's.....	4.	211.75	851.
Wakefield.....	7.	52.	99.5	Forest.....	2.75	214.50	865.0
Waverley.....	8.	60.	114.0	Goode's.....	6.	220.50	715.6
Disputanta.....	8.	68.	117.0	Lowry's.....	2.50	223.	773.3
Well's Sliding.....	7.	75.	.....	Liberty.....	5.50	225.50	947.0
Petersburg.....	6.	81.	93.0	Thaxton's.....	5.50	234.	949.3
Sutherland's.....	11.	92.	.....	Lisbon.....	3.	237.	.....
Church Road.....	3.	95.	302.5	Buford's.....	4.	241.	1,002.4
Ford's.....	6.	101.	306.6	Blue Ridge.....	5.	246.	1,235.7
Wilson's.....	7.	103.	367.0	Bonsack's.....	5.25	251.25	953.3
Wellville.....	4.	112.	420.0	Gish's.....	3.50	254.75	910.0
Blacks and Whites.....	6.	118.	425.0	Big Lick.....	2.75	257.50	912.3
Nottoway.....	6.	124.	421.3	Salem.....	6.75	264.25	1,006.5
Burkeville.....	9.	133.	527.9	Dyerle's.....	4.75	269.00	.....
Rice's.....	8.	141.	396.0	Big Spring.....	8.50	277.50	1,250.3
High Bridge.....	4.	145.	.....	Alleghany.....	3.	280.50	1,267.9
Farmville.....	4.	149.	316.4	Big Tunnel (Montgomery White Sulphur Springs)	4.	284.50	1,917.9
Tuggle's Tank.....	6.	155.	.....	Christiansburg.....	5.50	290.	2,000.0
Prospect.....	6.	161.	575.0	Vicker's.....	5.	295.	.....
Pamplin's.....	8.	169.	673.4	Central.....	5.50	300.50	1,772.5
Evergreen.....	6.	175.	.....	New River.....	1.50	302.	1,745.2

*Furnished by Major Henry Fink, Superintendent Transportation.

ATLANTIC, MISSISSIPPI AND OHIO RAILROAD—CONTINUED.

STATIONS.	Miles between Stations.	Miles from Norfolk.	Feet above Tide.	STATIONS.	Miles between Stations.	Miles from Norfolk.	Feet above Tide.
Dublin.....	6.50	308.50	2,054.2	Marion.....	6.	364.	2,123.5
Martin's.....	7.50	316.	1,906.6	Seven-Mile Ford.....	7.	371.	1,976.2
Clark's.....	7.	323.	.....	Glade Spring.....	9.	380.	2,075.6
Max Meadows.....	5.50	328.50	2,015.5	Emory & Henry College..	4.	384.	2,084.2
Kent's.....	3.75	332.25	.....	Abingdon.....	9.25	393.25	2,056.8
Wytheville.....	4.25	336.50	2,230.4	Montgomery's.....	5.75	399.	.....
Grubb's.....	5.	341.50	.....	Wallace's.....	3.50	402.50	.....
Crockett's.....	2.50	344.	.....	Bristol-Goodson.....	5.50	408.	1,676.5
Rural Retreat.....	5.50	349.50	2,502.9	SALTVILLE BRANCH.			
Hall's.....	3.	352.50	.....	Glade Spring.....	....	380.	2,075.6
Atkin's.....	5.50	358.	.....	Saltville	9.5	389.5	1,712.

WASHINGTON CITY, VIRGINIA MIDLAND AND GREAT SOUTHERN RAILROAD.*

STATIONS.	Miles between Stations.	Miles from Alexan- dria.	Feet above Tide.	STATIONS.	Miles between Stations.	Miles from Alexan- dria.	Feet above Tide.
Alexandria .....	...	...	19	Gordonsville.....	5	88½	499
Cameron.....	3¼	3¼	...	Lindsay's	4¼	93¼	477
A. and F. Crossing.....	1	4¼	...	Cobham.....	2¼	95½	401
Springfield.....	4	8¼	240	Campbell's.....	3	98½	...
Burke's.....	5¼	14	258	Keswick.....	3¼	102¼	435
Fairfax.....	3¼	17¼	382	Shadwell.....	3¼	105½	308
Clifton.....	3½	21¼	170	Charlottesville.....	4	109½	451
Manassas Junction.....	5¼	27	317	Lynchburg Junction.....	1	110½	...
Bristoe.....	4¼	31¼	190	Red Hill.....	8½	119	...
Nokesville.....	3	34¼	270	North Garden.....	2	121	...
Catlett's	4½	38¼	250	Covesville.....	5½	126½	...
Warrenton Junction.....	2¼	41	265	Faber's	4¼	131¼	...
Midland.....	3½	44½	321	Rockfish	1¼	133	...
Bealeton.....	3	47½	290	Elmington.....	4	137	...
Rappahannock.....	3½	51	275	Lovingsston	3½	140½	...
Brandy	5	56	359	Arrington.....	4½	145	...
Culpeper.....	6	62	403	Tye River.....	3½	148½	...
Mitchell's.....	7	69	350	New Glasgow.....	3	151½	...
Rapid Anne.....	4¼	73¼	306	Amherst Courthouse.....	5	156½	...
Orange Courthouse.....	5½	79¼	506	McIvor's.....	6	162½	...
Madison.....	4¼	83½	395	Burford's	3	165½	...

*Furnished by Colonel J. S. Barbour, President.

WASHINGTON CITY, VIRGINIA MIDLAND AND GREAT SOUTHERN RAILROAD—CONTINUED.

STATIONS.	Miles between Stations.	Miles from Alexan- dria.	Feet above Tide.	STATIONS.	Miles between Stations.	Miles from Ma- nassas.	Feet above Tide.
Lynchburg.....	5	170½	529	Thoroughfare.....	3½	13	399
Lucado	6	176½	833	Broad Run.....	5	16½	395
Lawyer's Road.....	5	181½	739	Plains.....	4½	21½	565
Evington	6	187½	724	Salem.....	6	26	633
Otter River.....	4	191½	665	Rectortown.....	3½	32	444
Lynch's.....	3	194½	730	Delaplane (Piedmont)...	4	35½	455
Staunton River.....	4	198½	560	Markham.....	5	39½	552
Sycamore	6½	205	733	Linden (Manassas Gap)...	4	44½	916
Ward's Springs.....	3½	208½	797	Happy Creek.....	2½	48½	790
Whittle's.....	6	214½	812	Front Royal.....	2	51	546
Chatham.....	5	219½	624	River (S.Fk Shenandoah)	4	53	493
Dry Fork.....	4½	224½	624	Buckton.....	1	57	503
Fall Creek.....	5½	229½	535	Water Lick.....	4	58	550
Danville.....	6½	236	413	Strasburg.....	1	62	637
Dundee.....	½	336½	...	Strasburg Junction.....	..	63	694
MANASSAS BRANCH.			From Ma- nassas.	WARRENTON BRANCH.			From Alexan- dria.
Manassas.....	9	..	317	Warrenton Junction.....	..	41	...
Gainesville.....	2	9	357	Melrose.....	3	44	...
Haymarket	2	11	337	Warrenton.....	6	50	...

CHESAPEAKE AND OHIO RAILROAD.*

STATIONS.	Miles between Stations.	Miles from Rich- mond.	Feet above Tide.	STATIONS.	Miles between Stations.	Miles from Rich- mond.	Feet above Tide.
James River.....	....	....	....	Hewlett's.....	4.63	35.38	276.
Richmond.....	5.50	....	36.	Beaver Dam.....	2.82	40.06	282.
Hunslett.....	3.35	5.50	100.	Green Bay.....	2.12	42.83	....
Atlee's.....	3.56	8.85	201.	Bumpass'.....	1.94	45.00	329.
Ashcake.....	2.35	12.41	199.	Buckner's.....	3.27	46.94	....
Peake's.....	3.43	14.76	194.	Frederick's Hall.....	6.10	50.21	348.
Hanover (C. H.).....	2.71	18.24	82.	Tolersville.....	5.77	56.31	461.
Wickham's	1.81	20.95	76.	Louisa Courthouse.....	4.41	62.03	452.
South Anna.....	4.78	22.76	....	Trevilian's.....	3.21	66.49	524.
Hanover Junction.....	2.85	27.54	134.	Green Springs.....	2.91	69.70	....
Anderson's	2.95	30.39	221.	Melton's.....	3.20	72.61	....
Noel's.....	2.04	33.34	254.	Gordonsville.....	4.53	75.81	493.

* Furnished by Engineers St. John and Whitcomb.

CHESAPEAKE AND OHIO RAILROAD—CONTINUED.

STATIONS.	Miles between Stations.	Miles from Rich- mond.	Feet above Tide.	STATIONS.	Miles between Stations.	Miles from Rich- mond.	Feet above Tide.
Lindsay's.....	2.21	80.69	477.	Fort Spring.....	6.82	244.32	1,625.
Cobham.....	2.93	82.90	401.	Alderson.....	8.14	251.14	1,550.
Campbell.....	3.75	85.53	....	Mason's Mill.....	1.47	259.28	1,527.
Keswick.....	3.38	89.58	435.	Lowell's.....	1.75	260.75	1,510.
Shadwell.....	3.85	92.96	303.	Talcott.....	5.50	262.50	1,510.
Charlottesville.....	.87	96.81	451.	268 Mile Post.....	4.69	268.00	1,434.
Lynchburg Junction.....	6.18	97.68	....	Hinton.....	5.89	272.69	1,368.
Ivy.....	2.96	104.30	516.	New River Falls.....	3.42	281.58	1,290.
Mechum's River.....	7.69	107.26	550.	Meadow Creek.....	4.60	285.00	1,265.
Greenwood.....	4.76	114.95	....	Pawpaw.....	4.66	289.60	1,237.
Afton.....	4.19	119.71	....	Quinnimont.....	3.43	294.26	1,196.
Blue Ridge Summit.....	....	....	1,646.92	Siding.....	2.79	297.69	1,150.
Waynesboro'.....	5.05	123.90	1,284.42	Buffalo.....	6.98	300.48	1,109.
Fishersville.....	7.43	128.95	1,321.	Dimmock.....	5.35	307.46	1,045.
Staunton.....	7.93	136.38	1,387.	Sewell.....	4.05	312.81	1,004.
Swoope's.....	2.95	144.31	1,653.	Nutallburg.....	1.89	316.86	948.
Buffalo Gap.....	2.24	147.26	1,885.	Fern Spring.....	.50	318.75	914.
North Mountain.....	2.47	149.50	2,060.	Fayette Station.....	4.84	319.25	908.
Variety Springs.....	1.36	151.97	1,905.	Hawk's Nest.....	2.11	324.09	828.
Elizabeth Furnace.....	1.82	153.33	1,812.	Cotton Hill.....	7.11	326.20	896.
Pond Gap.....	4.20	155.15	1,677.	Kanawha Falls.....	3.87	333.31	672.
Craigsville.....	5.09	159.35	1,516.	Loup Creek.....	5.51	337.18	647.
Bell's Valley.....	4.00	164.44	1,507.50	Cannelton.....	5.46	342.69	636.
Goshen.....	3.06	168.44	1,410.	Paint Creek.....	2.22	343.15	622.
Panther Gap.....	4.01	171.50	1,590.	Blacksburg.....	2.39	350.37	626.
Millboro'.....	1.88	175.51	1,679.50	Coalburg.....	3.34	352.76	625.
Mason's Tunnel.....	4.11	177.39	1,550.	Lewiston.....	3.73	356.10	616.
Crane's.....	4.50	181.50	1,361.	Brownstown.....	3.70	359.83	608.
Griffith's.....	2.14	186.00	1,165.	Alden.....	2.47	363.53	605.
Longdale.....	1.56	188.14	1,150.	Salton (Kanawha City)...	3.17	366.00	608.
Peter's (Longdale Junc.)..	1.80	189.70	1,175.	Charleston.....	5.68	369.17	602.
Clifton Forge.....	1.12	191.50	1,047.50	Spring Hill.....	6.06	374.85	600.
Williamson's.....	2.45	192.62	1,053.	St. Alban's (Coalsmouth)	3.78	380.91	594.
Jackson's River.....	1.68	195.07	1,135.	Scary.....	3.87	384.69	590.
Lowmoor Junction.....	3.32	196.75	1,155.	Scott.....	5.99	388.56	632.
Steele's.....	5.34	200.07	1,210.	Hurricane.....	5.62	394.55	683.
Covington.....	5.45	205.41	1,245.	Milton.....	3.10	401.17	586.
Callaghan's.....	4.50	210.86	1,427.	Thorndyke.....	5.82	404.27	640.
Backbone.....	6.34	215.36	1,690.	Barboursville.....	6.60	410.09	580.
Alleghany.....	5.45	221.70	2,050.	Guyandotte.....	1.25	416.69	560.
White Sulphur Springs*..	5.45	227.15	1,917.	Junction Switch.....	3.09	417.94	560.
Caldwell.....	5.30	232.60	1,765.	Huntington.....	....	421.03	566.50
Ronceverte.....	6.42	237.90	1,660.				

* This and all stations below are in West Virginia.

PIEDMONT AIR-LINE.

*Richmond and Danville and Piedmont Railroad.**

STATIONS.	Miles between Stations.	Miles from Rich- mond.	Feet above Tide.	STATIONS.	Miles between Stations.	Miles from Rich- mond.	Feet above Tide.
Richmond.....	...	....	25	Sutherlin's Mill.....	3.0	129.9	...
Manchester.....	0.7	0.7	35	Ringgold.....	5.3	135.2	...
R., F. & P. Junction... ..	0.7	1.4	..	Dundee.....	4.8	140.0	...
Rockfield.....	1.2	2.6	..	Danville.....	0.6	140.6	410
Granite.....	1.9	4.5	..	Va. & N. C. State line....	....	....	658
Powhite.....	3.4	7.9	..	Pelham†.....	8.7	149.3	739
Robio's.....	2.6	10.5	..	Ruffin.....	6.3	155.6	707
Coalfield.....	2.5	13.0	320	Reidsville.....	9.1	164.7	628
Tomahawk.....	4.5	17.5	254	Benaja.....	8.9	173.6	...
Powhatan.....	4.7	22.2	317	Brown's Summit.....	3.5	177.1	800
Mattoax.....	4.6	26.8	220	Morehead.....	3.7	180.8	...
Chula.....	3.6	30.4	277	Greensboro'.....	8.2	189.0	829
Amelia Courthouse.....	5.5	35.9	358	Salem Junction.....	2.9	191.9	....
Jetersville.....	7.4	43.3	443	Jamestown.....	7.3	199.2	....
Jennings' Ordinary.....	6.4	49.7	495	High Point.....	5.0	204.2	....
Burkeville.....	3.7	53.4	520	Thomasville.....	6.6	210.8	....
Green Bay.....	7.5	60.9	536	Lexington.....	10.8	221.6	....
Meherrin.....	4.0	64.9	536	Linwood.....	6.2	227.8	....
Keysville.....	8.5	73.4	625	Holtsburg... ..	3.5	231.3	....
Drake's Branch.....	7.6	81.0	375	Salisbury.....	7.1	238.4	....
Mossingford.....	2.8	83.8	357	China Grove.....	9.4	247.8	....
Roanoke.....	5.9	89.7	331	Coleman's... ..	4.0	251.8	....
Staunton River.....	0.8	90.5	...	Concord.....	9.0	260.8	....
Clover.....	3.7	94.2	488	Harrisburg.....	7.8	268.6	....
Scottsburg.....	6.4	100.6	339	Query.....	4.2	272.9	....
Wolf Trap.....	3.9	104.5	346	Air-Line Junction.....	7.7	280.5	....
Boston.....	4.4	108.9	322	C. C. Crossing.....	0.5	281.0	....
New's Ferry.....	8.5	117.4	337	Charlotte.....	1.0	282.0	....
Barksdale's.....	9.5	126.9	354				

* Furnished by General R. Lindsay Walker, Master of Roadway.

† The stations from this are in the State of North Carolina.

RICHMOND, FREDERICKSBURG AND POTOMAC RAILROAD.*

STATIONS.	Miles between Stations.	Miles from Rich- mond.	Feet above Tide.	STATIONS.	Miles between Stations.	Miles from Rich- mond.	Feet above Tide.
Richmond (Byrd Street) ..	....	....	88	Milford	4.75	39.75	100
Elba.....	1.25	1.25	183	Woodford.....	6.75	46.50	125
Boulton.....	0.75	2.00	199	Guiney's.....	2.40	48.90	121
Hungary.....	6.32	8.32	214	Summit.....	4.49	53.39	219
Kilby	5.12	13.44	212	Fredericksburg.....	7.97	61.36	42
Ashland.....	3.25	16.69	221	Potomac Run.....	6.14	67.52	85
Taylorville.....	4.96	21.65	119	Brooke.....	2.65	70.17	66
Hanover Junction.....	2.23	23.88	135	Richland.	6.43	76.60	10
Rutherglen.....	5.18	29.06	216	Y	4.27	80.87	..
Penola.....	5.94	35.00	94	Quantico.....	0.85	81.70	..

BALTIMORE AND POTOMAC RAILROAD.†

STATIONS.	Miles between Stations.	Miles from Rich- mond.	Feet above Tide.	STATIONS.	Miles between Stations.	Miles from Rich- mond.	Feet above Tide.
ALEX. AND FRED'G:				WASH. AND ALEX.:			
Quantico.....	3.9	81.7	16	Alexandria	1.7	109.0	33
Cherry Hill.....	2.0	85.6	7	St. Asaph Junction....	.2	110.7	45
Neabsco.....	3.4	87.6	30	W. & O. Junction ....	.6	110.9	47
Mount Pleasant.....	1.4	91.0	11	Four Mile Run.....	1.4	111.5	10
Wood Bridge.....	3.1	92.4	73	Waterloo .....	.3	112.9	50
Telegraph Road.....	3.2	95.5	82	Fort Runyon.....	.8	113.2	27
Long Branch.....	3.5	98.7	82	S. end Long Bridge....	2.1	114.0	12
Franconia.....	6.8	102.2	234	Washington.....	17.1	116.1	10
				Bowie.....	25.5	133.2	152
				Baltimore (B. & P. Stat'n)	...	153.7	68

RICHMOND AND PETERSBURG RAILROAD.‡

STATIONS.	Miles between Stations.	Miles from Rich- mond.	Feet above Tide.	STATIONS.	Miles between Stations.	Miles from Rich- mond.	Feet above Tide.
Richmond.....	..	..	82.	Halfway.....	3	11	114.
Shops.....	1	1	....	Chester.....	2	13	143.4
Manchester Crossing....	1	2	105.	Port Walthall.....	4	17	87.4
Temple's.....	3	5	85.5	Petersburg.....	6	23	17.1
Drewry's Bluff.....	3	8	118.7				

* Furnished by E. T. D. Myers, General Superintendent.

† Furnished by the Superintendent, through Assistant Engineer Joseph Wood.

‡ Furnished by A. Shaw, Superintendent.

PETERSBURG RAILROAD.*

STATIONS.	Miles between Stations.	Miles from Peters- burg.	Feet above Tide.	STATIONS.	Miles between Stations.	Miles from Peters- burg.	Feet above Tide.
Petersburg (Depot on) Appomattox.....f	..	..	10	Bellefield	10	42	131
Petersburg (Depot on) Washington Street...f	..	..	70	Pleasant Hill.....	10	52	145
Reams' Station.....	10	10	173	Garysburg	9	61	173
Stony Creek.....	11	21	91	Roanoke River Bridge...	..	..	47
Jarratt's.....	11	32	177	Weldon, N. C.....	4	65	62

SEABOARD AND ROANOKE RAILROAD.†

STATIONS.	Miles between Stations.	Miles from Ports- mouth.	Feet above Tide.	STATIONS.	Miles between Stations.	Miles from Ports- mouth.	Feet above Tide.
Portsmouth.....	0	0	..	Handsome.....	2	44	..
Pea Ridge.....	5	5	..	Newsom's.....	6	50	..
Bower's Hill.....	3	8	..	Boykin's.....	4	54	..
Stever's.....	6	14	..	Branchville.....	3	57	..
Suffolk.....	3	17	..	Margarettsville.....	6	63	..
¶ Purvis.....	9	26	..	Seaboard	7	70	..
Carrsville.....	5	31	..	Gary's.....	..	..	..
Franklin.....	6	37	..	Weldon.....	10	80	..
Nottoway.....	5	42	..				

RICHMOND, YORK RIVER AND CHESAPEAKE RAILROAD.‡

STATIONS.	Miles between Stations.	Miles from Rich- mond.	Feet above Tide.	STATIONS.	Miles between Stations.	Miles from Rich- mond.	Feet above Tide.
Richmond.....	0	0	16	White House.....	4	24	16
Fair Oaks.....	7	7	161	Fish Haul.....	2	26	42
Meadow.....	4	11	87	Cohoke	2	23	38
Dispatch.....	2	13	65	Sweet Hall.....	3	31	38
Summit.....	2	15	130	Romanceke.....	3	34	42
Tunstall's.....	5	20	58	West Point.....	4	33	7

* Furnished by R. M. Sully, General Freight Agent.

† Furnished by Col. H. T. Douglas, Supt.

‡ Furnished by E. G. Ghio, Superintendent.

§ Datum line 16 feet above high tide.

WASHINGTON AND OHIO RAILROAD.*

STATIONS.	Miles between Stations.	Miles from Alexandria.	Feet above Tide.	STATIONS.	Miles between Stations.	Miles from Alexandria.	Feet above Tide.
Alexandria .....	...	...	15	Guilford.....	3.75	27.	415
Junction.....	1.5	1.5	...	Farmwell.....	4.	31.	320
Carlin's Spring.....	5.	6.5	...	Leesburg	6.5	37.5	321
East Falls Church.....	2.5	9.	...	Clark's Gap.....	4.	41.5	578
Falls Church.....	1.5	10.5	...	Hamilton	3.5	45.	454
Vienna.....	4 ½	15.	395	Purcellville.....	3.5	48.5	553
Hunter's.....	3.	18.	345	Round Hill.....	3.	51.5	558
Thornton.....	3.	21.	...	Snickersville.....	3.	53.5	680
Herndon.....	2.25	23.25	395				

VALLEY RAILROAD.†

Branch of the Baltimore and Ohio Railroad.

STATIONS.	Miles between Stations.	Miles from Staunton.	Feet ‡ above Tide.	STATIONS.	Miles between Stations.	Miles from Staunton.	Feet above Tide.
Staunton.....	...	...	1,379 §	Maurertown.....	4¼	69	788
Verona.....	5½	5½	1,272	Tom's Brook.....	1¼	70¾	745
Fort Defiance.....	3¾	9¾	1,247	Strasburg Junction.....	4¼	75	663
Mt. Sidney.....	1¾	11	1,258	Strasburg.....	1¾	76¾	637
Weyer's Cave (Station)..	3	14	1,152	Capon Road.....	1	76	701
Mt. Crawford (Station)...	4¼	18¾	1,171	Cedar Creek.....	4	80	591
Pleasant Valley.....	3	21¾	1,248	Middletown.....	2	82	660
Harrisonburg.....	4¾	26	1,338	Newtown.....	4¾	86¾	731
Linville.....	6¾	32¾	1,242	Kernstown	3½	90¾	744
Cowan's.....	3¾	36	1,107	Winchester.....	3¾	94	717
Broadway.....	2½	38½	1,088	Stephenson's.....	5	99	499
Timberville.....	2½	41	1,018	Wadesville.....	4½	103½	495
New Market (Station)....	4	45	971	Summit Point.....	4½	108	623
Forest.....	4	49	953	Cameron.....	4½	112½	547
Mt. Jackson.....	3¾	52¼	916	Charlestown.....	3½	116	513
Bellow's	4	56¼	895 (?)	Halltown	4	120	339
Edinburg	3½	59¾	845	Harper's Ferry.....	6	126	277 ‖
Narrow Passage Bridge..	...	...	858	Washington.....	...	...	...
Woodstock	5	64¾	820	Baltimore.....	...	205	...

* Furnished by R. H. Havener, General Superintendent.

§ At crossing of C. & O. R. R.

† From Chief Eng. J. L. Randolph, through Asst. W. F. Elmer.

‖ Abutment of B. & O. R. R. bridge.

‡ The elevations are the sub-grade A. M. T.; the top of the rail is 22 inches higher.

JAMES RIVER AND KANAWHA CANAL.*

PLACES.	Miles between Places.	Miles from Rich- mond.	Feet above Tide.	PLACES.	Miles between Places.	Miles from Rich- mond.	Feet above Tide.
Tidewater .....	...	...	.....	Lock No. 14.....	3.5	56.0	208.25
Richmond—Basin.....	1.5	1.5	84.	Columbla	2.0	58.0	208.25
Rutherford's Mills.....	2.0	3.5	.....	Galt's Quarry	1.5	59.5	208.25
Lock No. 1.....	...	...	94.75	Lock No. 15.....	3.5	63.0	215.25
Lock No. 2.....	1.0	4.5	105.50	Lock No. 16.....	2.0	65.0	.....
Lock No. 3.....	2.5	7.0	115.50	New Canton.....	2.5	67.5	223.25
Rein's Island—River Lock	0.5	7.5	115.00	Lock No. 17.....	0.5	68.0	223.25
Westham.....	1.0	8.5	115.00	Bremo.....	1.5	69.5	233.75
Bosher's Dam—Locks 4 } and G.....	2.5	11.0	124.25	Middleton's Mills.....	2.0	71.5	233.75
Lock No. 5.....	...	....	134.00	Lock No. 18 and G.....	0.5	72.0	241.75
Lock No. 6.....	...	....	142.75	Lock No. 19 (7-Islands)...	0.5	72.5	250.50
Ellerslie	1.5	12.5	142.75	Virgin Mills.....	1.0	73.5	250.50
Tuckahoe Railroad Basin	1.0	13.5	145.75	Lock No. 20.....	0.5	74.0	259.16
Tuckahoe Aqueduct.....	0.5	14.0	142.75	Lock No. 21.....	0.5	74.5	267.82
Tuckahoe.....	0.5	14.5	142.75	Bolling's Landing.....	1.0	75.5	267.82
Powell's Bridge.....	1.5	16.0	142.75	Lock No. 22.....	3.0	78.5	274.50
Manakintown Ferry Road	2.0	18.0	142.75	Scottsville.....	2.0	80.5	274.50
Manakin.....	0.5	18.5	142.75	Lock No. 23.....	1.0	81.5	292.20
Sampson's Lock.....	1.0	19.5	143.25	Lock No. 24.....	2.5	84.0	290.50
Dover Mills and Aque- } duct.....	2.0	21.5	143.25	Warren—Lock No. 25....	2.5	86.5	298.50
Sabbot Hill.....	1.0	22.5	143.25	Lock No. 26.....	1.5	88.0	306.50
Dover.....	0.5	23.0	143.25	Lock No. 27.....	2.5	90.5	314.50
Jude's Ferry Road.....	0.5	23.5	143.25	Howardsville—Lock No 28	1.5	92.0	322.50
Contention	3.0	26.5	143.25	Lock No. 29.....	4.5	96.5	331.25
Beaver Dam Aqueduct†..	1.5	28.0	143.25	Lock No. 30.....	2.0	98.5	340.00
Malden's Adventure Dam	1.0	29.0	143.25	Warminster.....	1.5	100.0	340.00
Michaux's Ferry.....	3.0	32.0	143.25	Lock No. 31.....	1.0	101.0	348.25
Cedar Point Locks {No. 7 {No. 8	...	....	156.25	Midway Mills.....	1.5	102.5	348.25
Lickinghole Aqueduct— } Lock No. 9.....	1.5	35.5	167.25	Hardwicksville—Lock } No. 32.....	2.0	104.5	353.25
Bolling Hall.....	1.0	36.5	167.25	New Market (Norwood)..	4.5	109.0	353.25
Lock No. 10.....	2.5	39.0	167.25	Locks Nos. 33 and 34....	...	.....	375.25
Jefferson Ferry Road....	1.5	40.5	177.25	Lock No. 35.....	3.5	112.5	383.25
Rock Castle.....	1.0	41.5	177.25	Lock No. 36.....	1.5	114.0	391.25
Lock No 11 (Loch Lomond)	...	....	185.25	Greenway.....	0.5	114.5	391.25
Bolling Island.....	4.0	45.5	185.25	Lock No. 37.....	2.0	116.5	399.25
Pemberton—Lock No. 12†	2.5	43.0	192.25	Bent Creek—Lock No. 38,	1.5	118.0	407.25
Lock No. 13.....	2.5	50.5	200.25	Lock No. 39.....	2.0	120.0	415.25
Elk Hill.....	2.0	52.5	200.25	Elk Creek Mills.....	1.0	121.0	415.25
				Lock No. 40.....	2.0	123.0	423.25
				Lock No. 41.....	0.5	123.5	431.25

*Furnished by Colonel C. S. Carrington, President.

†Issaquena.

‡Cartersville.

JAMES RIVER AND KANAWHA CANAL—CONTINUED.

PLACES.	Miles between Places.	Miles from Rich- mond.	Feet above Tide.	PLACES.	Miles between Places.	Miles from Rich- mond.	Feet above Tide.
Lock No. 42.....	3.0	126.5	439.25	Lock No. 7.....	1.0	167.5	618.87
Lock No. 43.....	2.0	128.5	447.25	Lock No. 8.....	0.5	168.0	626.87
Lock No. 44.....	2.5	131.0	455.25	Lock No. 9.....	0.5	168.5	634.87
Staples' Mills.....	1.0	132.0	455.25	Lock No. 10.....	1.0	169.5	643.87
Lock No. 45.....	1.0	133.0	463.25	Cushaw Dam—Locks } Nos. 11 and 6 G..... }	1.0	170.5	648.87
Galt's Mills.....	0.5	133.5	463.25	Rope Ferry—Lock No. 12	0.5	171.0	660.87
Joshua Falls Dam.....	2.0	135.5	463.25	Lock No. 13.....	0.5	171.5	672.87
Crossing of James } River—Locks 46 & 47 }	2.0	137.5	479.75	Lock No. 14.....	1.0	172.5	680.87
Lock No. 48.....	0.5	138.0	487.75	Lock No. 15.....	1.0	173.5	688.87
Lock No. 49.....	3.0	141.0	495.75	Lock No. 16.....	...	.....	696.87
Beaver Creek.....	0.5	141.5	495.75	Lock No. 17.....	0.5	174.0	705.87
Lock No. 50.....	0.5	142.0	503.75	Cement Mills—Lock No. } 7 G..... }	1.5	175.5	705.87
Lock No. 51.....	3.5	145.5	513	North River Bridge— } Mouth of North River }	0.5	176.0	705.87
Lynchburg.....	2.0	147.5	513	Lock No. 18.....	2.0	178.0	720.37
Lynchburg Water- } works Dam..... }	1.0	148.5	513	Quarry Falls Dam— } Lock No. 8 G..... }	0.5	178.5	720.37
Lock No. 1—Second Di- } vision..... }	1.5	150.0	525.75	Lock No. 19.....	2.0	180.5	734.37
Lock No. 2.....	1.0	151.0	538.50	Lock No. 20.....	...	.....	741.37
Judith's Dam—Lock No. } 1 G..... }	1.0	152.0	539.75	Lock No. 21.....	2.0	182.5	749.37
Bethel—Lock No. 3.....	4.0	156.0	557.75	Lock No. 22.....	1.0	183.5	759.37
Bald Eagle Dam—Lock } No. 2 G..... }	1.0	157.0	557.75	Varney's Falls Dam— } Lock No. 9 G..... }	2.0	185.5	759.37
Lock No. 4 (Holcomb's } Rock)..... }	2.5	159.5	570.75	Lock No. 23.....	3.0	188.5	774.62
Pedler Dam—Lock No. } 3 G..... }	0.5	160.0	571.87	Lock No. 24.....	...	.....	782.62
Tumbling Run—Lock } No. 5..... }	2.0	162.0	587.87	Indian Rock Dam— } Lock 10 G..... }	1.0	189.5	785.62
Coleman's Fall Dam— } Lock No. 4 G..... }	0.5	162.5	587.87	Lock No. 25.....	3.0	192.5	802.12
Read Creek—Lock No. 6..	3.0	165.5	604.87	Lock No. 26.....	0.5	193.0	811.72
Big Island Dam—Lock } No. 5 G..... }	1.0	166.5	605.87	Wasp Rock Dam—Lock } No. 11 G..... }	1.0	194.0	811.72
				Buchanan.....	4.0	198.0	811.72

NORTH RIVER IMPROVEMENT.

Branch of the James River and Kanawha Canal.

PLACES.	Miles between Places.	Miles from Rich- mond.	Feet above Tide.	PLACES.	Miles between Places.	Miles from Rich- mond.	Feet above Tide.
North River Bridge— } Mouth of North River }	...	176.0	705.87	Hart's Bottom.....	2.0	185.5	.....
Mouth of Buffalo Creek..	4.5	180.5	.....	Bensalem.....	4.0	189.5	.....
Thompson's Landing.....	3.0	183.5	.....	Mouth of South River...	2.0	191.5	.....
				Lexington.....	4.5	196.0	893.87

APPENDIX B.

TABLE II.—POPULATION OF THE STATE OF VIRGINIA, BY COUNTIES.
(As in the UNITED STATES CENSUS OF 1870).

COUNTIES.	AGGREGATE.								
	1870.	1860.	1850.	1840.	1830.	1820.	1810.	1800.	1790.
Total	1225,163	1219,630	1119,348	a9,967 1015,269	a9,573 1034,481	*210 a9,703 928,343	a8,552 869,131	a5,949 801,608	691,737
Variances from former official totals..						b—22			
Accomac	20,409	18,586	17,890	17,096	16,656	15,966	15,743	15,693	13,959
Albemarle.....	27,544	26,625	25,800	22,924	22,618	*3 19,747	18,268	16,439	12,585
Alexandria	16,755	12,652	10,008	a9,967	a9,573	a9,703	a8,552	a5,949	.....
Alleghany.....	3,674	6,765	3,515	2,749	2,816	.....	.....	.....	.....
Amelia	9,578	10,741	9,770	10,320	11,036	*110 10,994	10,594	9,432	c18,097
Amherst.....	14,900	13,742	12,639	12,576	12,071	10,423	10,548	16,801	13,703
Appomattox.....	8,950	8,889	9,193	.....	.....	.....	.....	.....	.....
Augusta.....	28,763	27,749	24,610	19,628	19,926	16,742	14,308	11,712	10,886
Bath.....	3,795	3,676	3,426	4,300	4,002	*6 5,231	4,837	5,508	.....
Bedford.....	25,327	25,068	24,080	20,203	20,246	19,305	16,148	14,125	10,531
Bland (d).....	4,000	.....	.....	.....	.....	.....	.....	.....	.....
Botetourt.....	11,329	11,516	14,908	11,679	16,354	13,589	13,301	10,427	10,524
Brunswick.....	13,427	14,809	13,894	14,346	15,767	16,687	15,411	16,339	12,827
Buchanan.....	3,777	2,793	.....	.....	.....	.....	.....	.....	.....
Buckingham.....	13,371	15,212	13,837	18,786	18,351	17,569	20,059	13,389	9,779
Campbell.....	28,384	26,197	23,245	21,030	20,350	16,569	11,001	9,866	7,685
Caroline.....	15,128	18,464	18,456	17,813	17,760	*26 17,982	17,544	17,438	17,489
Carroll.....	9,147	8,012	5,909	.....	.....	.....	.....	.....	.....
Charles City.....	4,975	5,609	5,200	4,774	5,500	5,255	5,186	5,365	5,533
Charlotte.....	14,513	14,471	13,955	14,595	15,252	13,290	13,161	11,912	10,078
Chesterfield.....	18,470	19,016	17,489	17,148	18,637	18,003	9,979	14,488	14,214

TABLE II.—CONTINUED.

COUNTIES.	AGGREGATE.								
	1870.	1880.	1880.	1840.	1880.	1820.	1810.	1800.	1790.
Clarke.....	6,670	7,146	7,352	6,353	.....	.....	.....	.....	.....
Craig.....	2,942	3,553	.....	.....	.....	.....	.....	.....	.....
Culpeper.....	12,227	12,063	12,282	11,393	24,027	*2 20,942	18,967	18,100	22,105
Cumberland.....	8,142	9,961	9,751	10,399	11,690	11,023	9,992	9,839	8,153
Dinwiddie.....	30,702	30,198	25,118	22,558	21,901	20,482	18,190	15,374	13,934
Elizabeth City.....	8,303	5,798	4,586	3,706	5,053	3,789	3,608	2,778	3,450
Essex.....	9,927	10,469	10,206	11,309	10,521	9,909	9,376	9,508	9,122
Fairfax.....	12,952	11,834	10,682	9,370	9,204	11,404	13,111	13,317	12,320
Fauquier.....	19,690	21,706	20,868	21,897	26,086	23,103	22,689	21,329	17,892
Floyd.....	9,824	8,236	6,458	4,453	.....	.....	.....	.....	.....
Fluvanna.....	9,875	10,353	9,487	8,812	8,221	6,704	4,775	4,623	3,921
Franklin.....	18,264	20,098	17,430	15,832	14,911	12,017	10,724	9,302	6,842
Frederick.....	16,596	16,546	15,975	14,242	26,046	24,706	22,574	24,744	19,681
Giles (d).....	5,875	6,883	6,570	5,307	5,274	4,521	3,745	.....	.....
Gloucester.....	10,211	10,956	10,527	10,715	10,608	9,678	10,427	8,181	13,498
Goochland.....	10,313	10,656	10,352	9,760	10,369	10,007	10,203	9,696	9,053
Grayson.....	9,587	8,252	6,677	9,087	7,675	5,598	4,941	3,912	.....
Greene.....	4,634	5,022	4,400	4,232	.....	.....	.....	.....	.....
Greensville.....	6,362	6,374	5,639	6,366	7,117	6,858	6,853	6,727	6,362
Halifax.....	27,828	26,520	25,962	25,936	23,034	19,060	22,133	19,377	14,722
Hanover.....	16,455	17,222	15,153	14,968	16,253	15,267	15,082	14,403	14,754
Henrico.....	66,179	61,616	43,572	33,076	28,797	23,667	19,680	14,886	12,000
Henry.....	12,303	12,105	8,872	7,335	7,100	5,624	5,611	5,259	8,479
Highland.....	4,151	4,319	4,227	.....	.....	.....	.....	.....	.....
Isle of Wight.....	8,320	9,977	9,353	9,972	10,517	*21 10,118	9,186	9,342	9,028
James City.....	4,425	5,798	4,020	3,779	3,838	4,563	4,094	3,931	4,070
King and Queen.....	9,709	10,328	10,319	10,862	11,644	11,798	10,988	9,879	9,377
King George.....	5,742	6,571	5,971	5,927	6,397	6,116	6,454	6,749	7,366
King William.....	7,515	8,530	8,779	9,258	9,812	9,697	9,285	9,055	8,128
Lancaster.....	5,355	5,151	4,708	4,623	4,801	5,517	5,592	5,375	5,638
Lee.....	13,268	11,032	10,267	8,441	6,461	4,256	4,694	3,538	.....
Loudoun.....	20,929	21,774	22,079	20,431	21,939	22,702	21,338	20,523	18,962
Louisa.....	16,332	16,701	16,691	15,433	16,151	13,746	11,900	11,892	8,467
Lunenburg.....	10,403	11,983	11,692	11,055	11,957	10,662	12,265	10,381	8,959
Madison.....	8,670	8,854	9,331	8,107	9,236	8,490	8,381	8,322	.....
Mathews.....	6,200	7,091	6,714	7,442	7,664	6,920	4,227	5,806	.....
Mecklenburg.....	21,318	20,096	20,630	20,724	20,477	19,786	18,453	17,008	14,733
Middlesex.....	4,981	4,364	4,394	4,392	4,122	4,057	4,414	4,203	4,140
Montgomery.....	12,556	10,617	8,859	7,405	12,306	8,733	8,409	9,044	13,228
Nansemond.....	11,276	13,693	12,283	10,795	11,784	10,494	10,324	11,127	9,010

TABLE II.—CONTINUED.

COUNTIES.	AGGREGATE.								
	1870.	1860.	1850.	1840.	1830.	1820.	1810.	1800.	1790.
Nelson.....	13,898	13,015	12,768	12,287	11,254	10,137	9,684	.....	.....
New Kent.....	4,381	5,884	6,064	6,230	6,458	6,630	6,478	6,363	6,233
Norfolk.....	46,702	36,227	33,036	27,569	24,806	^{*7} 23,936	22,872	19,419	14,524
Northampton.....	8,046	7,532	7,498	7,715	8,641	7,705	7,474	6,763	6,889
Northumberland.....	6,863	7,531	7,346	7,924	7,953	8,016	8,308	7,803	9,163
Nottoway.....	9,291	8,836	8,437	9,719	10,130	^{*2} 9,656	9,278	9,401	(c)
Orange.....	10,396	10,851	10,067	9,125	14,637	^{*33} 12,880	12,323	11,449	9,921
Page.....	8,462	8,109	7,600	6,194	.....	.....	.....	.....	.....
Patrick.....	10,161	9,359	9,609	8,032	7,395	5,089	4,695	4,331	.....
Pittsylvania.....	31,343	32,104	28,796	26,398	26,034	21,323	17,172	12,697	11,579
Powhatan.....	7,667	8,392	8,178	7,924	8,517	8,292	8,073	7,769	6,822
Prince Edward.....	12,004	11,844	11,887	14,069	14,107	12,577	12,409	10,962	8,107
Prince George.....	7,820	8,411	7,596	7,175	8,367	8,030	8,050	7,425	8,173
Princess Anne.....	8,273	7,714	7,669	7,285	9,102	8,768	9,498	8,859	7,793
Prince William.....	7,504	8,565	8,129	8,144	9,330	9,419	11,311	12,733	11,615
Pulaski.....	6,538	5,416	5,118	3,739	.....	.....	.....	.....	.....
Rappahannock.....	8,261	8,850	9,752	9,257	.....	.....	.....	.....	.....
Richmond.....	6,503	6,556	6,448	5,965	6,055	5,706	6,214	6,174	6,985
Roanoke.....	9,350	8,048	8,477	5,499	.....	.....	.....	.....	.....
Rockbridge.....	16,058	17,248	16,045	14,284	14,244	11,945	10,318	8,945	6,543
Rockingham.....	23,668	23,408	20,294	17,344	20,683	14,784	12,753	10,374	7,449
Russell.....	11,103	10,280	11,919	7,878	6,714	5,536	6,319	4,808	3,333
Scott.....	13,036	12,072	9,829	7,303	5,724	4,263	.....	.....	.....
Shenandoah.....	14,936	13,896	13,768	11,618	19,750	18,926	13,646	13,823	10,510
Smyth.....	8,898	8,952	8,162	6,522	.....	.....	.....	.....	.....
Southampton.....	12,285	12,915	13,521	14,525	16,074	14,170	13,497	13,925	12,864
Spotsylvania.....	11,728	16,076	14,911	15,161	15,134	14,254	13,296	13,002	11,252
Stafford.....	6,420	8,555	8,044	8,454	9,362	9,517	9,830	9,971	9,588
Surry.....	5,585	6,133	5,679	6,480	7,109	6,594	6,855	6,535	6,227
Sussex.....	7,885	10,175	9,820	11,229	12,720	11,884	11,362	11,062	10,549
Tazewell (d).....	10,791	9,920	9,942	6,290	5,749	3,916	3,007	2,127	.....
Warren.....	5,716	6,442	6,607	5,627	.....	.....	.....	.....	.....
Warwick.....	1,672	1,740	1,546	1,456	1,570	1,608	1,885	1,659	1,690
Washington.....	16,816	16,892	14,612	13,001	15,614	12,444	12,156	9,536	5,625
Westmoreland.....	7,682	8,282	8,080	8,019	8,896	6,901	8,102	(e)	7,722
Wise.....	4,785	4,508	.....	.....	.....	.....	.....	.....	.....
Wythe (d).....	11,611	12,305	12,024	9,375	12,163	9,692	8,356	6,380	.....
York.....	7,198	4,949	4,460	4,720	5,354	4,384	5,187	3,231 f48	5,233

TABLE II.—CONTINUED.

COUNTIES.	WHITE.								
	1870.	1880.	1885.	1890.	1895.	1900.	1905.	1910.	1915.
Total.....	712,089	691,773	616,069	567,731 537,952	567,411 537,216	566,556 482,849	565,784 458,159	564,394 443,386	563,524
Variances from former official totals.....	.....	.....	.....	b—110	.....	b—11	b—20	.....	.....
Accomac.....	12,567	10,661	9,608	9,618	9,458	9,386	9,341	9,723	8,976
Albemarle.....	12,550	12,103	11,875	10,512	10,455	8,715	8,642	8,796	6,835
Alexandria.....	9,444	9,851	7,217	567,731	566,411	565,556	565,784	564,394	.....
Alleghany.....	3,095	5,643	2,763	2,142	2,197	.....	.....	.....	.....
Amelia.....	3,055	2,897	2,785	3,074	3,293	3,407	3,253	2,789	566,84
Amherst.....	8,184	7,167	6,352	6,426	5,883	4,610	5,143	9,205	8,286
Appomattox.....	4,414	4,118	4,209	.....	.....	.....	.....	.....	.....
Augusta.....	22,026	21,547	18,983	15,072	15,257	12,963	11,232	9,671	9,260
Bath.....	2,906	2,652	2,434	3,170	2,797	3,965	3,906	4,830	.....
Bedford.....	14,557	14,888	13,546	11,016	11,123	10,953	9,783	9,826	7,725
Bland.....	3,783	.....	.....	.....	.....	.....	.....	.....	.....
Botetourt.....	8,166	8,441	10,746	8,877	11,798	10,493	10,725	8,773	9,241
Brunswick.....	4,525	4,992	4,885	4,978	5,397	5,889	5,665	6,647	5,919
Buchanan.....	3,730	2,762	.....	.....	.....	.....	.....	.....	.....
Buckingham.....	5,669	6,041	5,426	7,823	7,177	7,345	7,780	6,824	5,496
Campbell.....	14,041	13,588	11,533	10,213	9,995	8,447	5,370	5,893	4,946
Caroline.....	7,077	6,948	6,891	6,725	6,499	6,497	6,452	6,492	6,994
Carroll.....	8,819	7,719	5,726	.....	.....	.....	.....	.....	.....
Charles City.....	1,822	1,806	1,664	1,671	1,782	1,750	1,776	1,954	2,084
Charlotte.....	4,930	4,981	4,615	5,030	5,583	5,005	5,354	5,506	5,199
Chesterfield.....	9,730	10,019	8,406	7,859	7,709	7,543	3,692	6,317	6,358
Clarke.....	4,511	3,707	3,614	2,867	.....	.....	.....	.....	.....
Craig.....	2,712	3,103	.....	.....	.....	.....	.....	.....	.....
Culpeper.....	6,058	4,959	5,112	4,933	12,046	11,136	10,391	10,479	13,809
Cumberland.....	2,709	2,946	3,082	3,263	4,054	3,966	3,715	3,945	3,577
Dinwiddie.....	13,017	13,678	10,942	9,847	8,655	8,470	7,010	6,347	6,039
Elizabeth City.....	2,832	3,180	2,341	1,954	2,704	2,076	1,799	1,238	1,556
Essex.....	3,277	3,296	3,035	3,955	3,647	3,499	3,411	3,465	3,543
Fairfax.....	8,667	8,046	6,835	5,469	4,892	6,224	6,626	7,035	7,611
Fauquier.....	11,834	10,430	9,875	10,501	12,950	11,429	11,984	12,444	11,157
Floyd.....	8,827	7,745	6,001	4,123	.....	.....	.....	.....	.....
Fluvanna.....	4,778	5,093	4,539	4,445	4,223	3,375	2,576	2,659	430
Franklin.....	12,263	13,642	11,638	10,500	9,728	8,227	7,966	7,701	5,735
Frederick.....	13,863	13,079	12,769	11,119	17,361	16,557	15,547	18,628	15,815
Giles.....	5,272	6,038	5,588	4,681	4,760	4,174	3,478	.....	.....
Gloucester.....	4,782	4,517	4,290	4,412	4,314	4,008	4,183	3,237	6,225
Goochland.....	3,711	3,814	3,863	3,570	3,857	3,796	4,230	4,480	4,140

TABLE II.—CONTINUED.

COUNTIES.	WHITE.								
	1870.	1880.	1890.	1900.	1910.	1920.	1930.	1940.	1950.
Grayson.....	8,833	7,653	6,142	5,542	7,161	5,170	4,641	3,741	.....
Greene	3,182	3,015	2,667	2,447	.....	.....	.....	.....	.....
Greensville.....	2,155	1,974	1,731	1,928	2,104	2,056	2,254	2,398	2,530
Halifax.....	11,562	11,060	10,976	11,145	12,916	8,758	12,117	11,168	8,931
Hanover.....	7,893	7,482	6,539	6,262	6,526	6,130	6,219	5,952	6,291
Henrico.....	35,148	37,966	23,826	16,900	13,471	11,763	9,182	6,836	5,600
Henry.....	6,722	6,773	5,324	4,243	4,058	3,321	3,641	3,715	6,763
Highland	3,803	3,890	3,837	.....	.....	.....	.....	.....	.....
Isle of Wight.....	4,874	5,037	4,710	4,918	5,023	4,883	4,447	4,735	4,786
James City.....	1,985	2,167	1,489	1,325	1,283	1,551	1,354	1,374	1,519
King and Queen.....	4,221	3,801	4,094	4,426	4,714	5,460	4,718	4,335	4,159
King George.....	2,927	2,510	2,301	2,269	2,476	2,349	2,331	2,598	3,123
King William.....	2,943	2,559	2,701	3,150	3,155	3,449	3,294	3,139	2,893
Lancaster.....	2,198	1,951	1,802	1,903	1,976	2,388	2,276	2,090	2,259
Lee.....	12,263	10,185	9,440	7,829	5,830	3,885	4,337	3,292	.....
Loudoun.....	15,235	15,021	15,051	13,840	15,497	16,144	15,577	15,200	14,749
Louisa.....	6,269	6,153	6,423	6,047	6,468	5,967	5,253	5,768	3,889
Lunenburg	4,344	4,421	4,314	4,132	4,470	3,873	4,933	4,372	4,547
Madison.....	4,950	4,360	4,456	3,729	4,289	3,800	4,323	4,836	.....
Mathews.....	4,104	3,865	3,642	3,969	3,994	3,616	2,118	2,985	.....
Mecklenburg	7,162	6,778	7,256	7,754	7,471	7,710	7,696	7,779	7,555
Middlesex.....	2,459	1,863	1,903	2,041	1,868	1,756	1,811	1,603	1,531
Montgomery.....	9,674	8,251	6,822	5,825	10,224	7,447	7,253	8,037	12,394
Nansemond.....	6,059	5,732	5,424	4,858	5,143	4,575	4,593	5,500	4,713
Nelson.....	7,586	6,649	6,478	6,168	5,186	4,395	4,897	.....	.....
New Kent.....	2,005	2,145	2,222	2,472	2,586	2,537	2,445	2,523	2,391
Norfolk.....	24,380	24,357	20,329	15,444	13,314	13,260	12,221	11,401	8,928
Northampton.....	3,198	2,908	3,105	3,341	3,574	3,369	3,216	2,931	3,181
Northumberland.....	3,808	3,870	3,072	4,034	4,029	4,134	4,162	3,679	4,506
Nottoway.....	2,241	2,270	2,234	2,490	2,965	2,805	2,730	3,311	(c)
Orange	4,938	4,553	3,962	3,575	6,456	5,219	5,711	6,160	5,436
Page.....	7,476	6,875	6,332	5,197	.....	.....	.....	.....	.....
Patrick	7,836	7,158	7,187	6,087	5,496	3,776	3,696	3,552	.....
Pittsylvania.....	15,259	17,105	15,263	14,283	14,694	12,636	10,710	8,503	8,538
Powhatan.....	2,552	2,580	2,513	2,432	2,661	2,492	2,484	2,393	2,286
Prince Edward.....	4,106	4,037	4,177	4,923	5,039	4,627	5,264	4,975	4,082
Prince George.....	2,774	2,899	2,670	2,692	3,069	3,119	3,101	2,795	3,387
Princess Anne.....	4,869	4,333	4,280	3,996	5,025	4,812	5,305	5,200	4,527
Prince William.....	5,691	5,690	5,079	4,867	5,127	4,761	5,733	6,975	6,744
Pulaski.....	4,729	3,814	3,613	2,768	.....	.....	.....	.....	.....
Rappahannock	5,195	5,018	5,642	5,307	.....	.....	.....	.....	.....

TABLE II.—CONTINUED.

COUNTIES.	WHITE.								
	1870.	1860.	1850.	1840.	1830.	1820.	1810.	1800.	1790.
Richmond.....	3,475	3,570	3,463	3,092	2,975	2,749	2,775	25,334	2,918
Roanoke.....	6,218	5,250	5,812	3,845	.....	.....	.....	.....	.....
Rockbridge.....	12,162	12,841	11,484	10,448	10,465	9,038	8,445	7,778	5,825
Rockingham.....	21,152	20,489	17,496	14,944	17,814	12,646	11,049	9,266	6,677
Russell.....	9,936	9,130	10,866	7,152	6,002	4,959	5,897	4,443	3,143
Scott.....	12,512	11,530	9,322	6,911	5,378	3,992	.....	.....	.....
Shenandoah.....	14,260	12,827	12,565	10,320	16,869	16,708	12,461	12,947	9,979
Smyth.....	7,654	7,732	6,898	5,539	.....	.....	.....	.....	.....
Southampton.....	5,468	5,713	5,940	6,171	6,573	6,127	5,982	6,461	6,312
Spotsylvania.....	7,069	7,716	6,894	6,786	6,384	5,939	5,596	5,875	5,171
Stafford.....	4,935	4,922	4,415	4,489	4,713	4,788	5,319	5,435	5,465
Surry.....	2,393	2,334	2,215	2,557	2,865	2,642	2,751	2,777	2,762
Sussex.....	2,962	3,118	3,086	3,584	4,118	4,155	4,436	4,582	4,771
Tazewell.....	9,198	8,625	8,807	5,466	4,911	3,435	2,661	1,895	.....
Warren.....	4,611	4,583	4,493	3,851	.....	.....	.....	.....	.....
Warwick.....	620	662	599	604	633	620	697	614	667
Washington.....	14,156	14,095	12,369	10,731	12,785	10,393	10,581	8,250	5,167
Westmoreland.....	3,531	3,387	3,376	3,466	3,710	3,031	3,401	(e)	3,183
Wise.....	4,717	4,416	.....	.....	.....	.....	.....	.....	.....
Wythe.....	9,269	9,986	9,618	7,632	9,952	8,111	7,180	5,538	.....
York.....	2,507	2,342	1,825	1,958	2,129	1,533	1,798	1,166 f8	2,115
FREE COLORED.									
Total.....	512,341	55,269	51,251	a1,862 46,809	a1,548 45,181	a1,290 35,470	a977 29,292	a383 19,598	12,254
Variances from former official totals..	.....	.....	.....	b—10	.....	b—6	.....	.....	.....
Accomac.....	7,842	3,418	3,295	2,848	2,544	2,100	1,860	1,541	721
Albemarle.....	14,994	606	587	603	484	373	400	207	171
Alexandria.....	7,310	1,415	1,409	a1,862	a1,548	a1,290	a977	a383	.....
Alleghany.....	579	132	58	60	48	.....	.....	.....	.....
Amelia.....	6,823	189	166	223	220	187	155	58	c106
Amherst.....	6,704	297	394	373	263	246	198	134	121
Appomattox.....	4,536	171	185	.....	.....	.....	.....	.....	.....
Augusta.....	6,737	586	574	421	404	267	196	95	59
Bath.....	889	78	45	88	65	64	49	17	.....
Bedford.....	10,770	504	463	323	341	311	212	202	52
Bland.....	217	.....	.....	.....	.....	.....	.....	.....	.....
Botetourt.....	3,163	306	426	377	386	290	300	135	24
Brunswick.....	8,902	671	553	563	612	717	378	270	132

TABLE II.—CONTINUED.

COUNTIES.	FREE COLORED.								
	1870.	1880.	1890.	1900.	1910.	1920.	1930.	1940.	1950.
Buchanan.....	47	1	.....	.....	.....	.....	.....	.....	.....
Buckingham.....	7,711	360	250	449	245	285	604	229	115
Campbell.....	14,343	1,029	846	772	859	677	263	302	251
Caroline.....	8,038	844	904	774	520	486	323	365	203
Carroll.....	323	31	29	.....	.....	.....	.....	.....	.....
Charles City.....	3,153	856	772	670	761	538	387	398	363
Charlotte.....	9,613	252	352	305	236	161	210	123	63
Chesterfield.....	8,733	643	467	587	591	947	972	319	369
Clarke.....	2,159	64	124	161	.....	.....	.....	.....	.....
Craig.....	230	30	.....	.....	.....	.....	.....	.....	.....
Culpeper.....	6,169	429	457	391	564	338	264	273	70
Cumberland.....	5,433	310	340	355	327	244	175	183	142
Dinwiddie.....	17,664	3,746	3,296	2,764	2,890	1,833	1,565	674	561
Elizabeth City.....	5,471	201	97	44	131	70	75	18	18
Essex.....	6,650	477	409	598	467	364	306	276	139
Fairfax.....	4,284	672	597	448	311	507	543	204	135
Fauquier.....	7,856	821	643	688	613	507	344	131	93
Floyd.....	997	16	14	9	.....	.....	.....	.....	.....
Fluvanna.....	5,097	266	211	221	203	123	57	44	25
Franklin.....	5,996	105	66	174	195	143	86	27	34
Frederick.....	2,733	1,208	912	821	1,265	970	610	453	116
Giles.....	598	67	55	49	49	42	25	.....	.....
Gloucester.....	5,429	703	680	612	603	462	446	35	210
Goochland.....	6,601	703	644	690	796	655	509	413	257
Grayson.....	754	52	36	53	52	83	30	1	.....
Greene.....	1,452	23	34	45	.....	.....	.....	.....	.....
Greensville.....	4,207	233	123	136	332	290	.....	213	212
Halifax.....	16,266	563	534	575	590	422	353	298	226
Hanover.....	8,562	257	221	312	449	381	409	259	240
Henrico.....	31,031	3,590	3,637	2,939	3,045	2,100	1,904	1,149	581
Henry.....	5,581	314	208	240	174	125	215	129	165
Highland.....	348	27	26	.....	.....	.....	.....	.....	.....
Isle of Wight.....	3,446	1,370	1,248	1,268	1,222	933	698	578	375
James City.....	2,440	1,042	663	507	572	552	420	163	146
King and Queen.....	5,488	388	461	499	416	297	267	164	76
King George.....	2,815	383	267	276	287	263	197	164	86
King William.....	4,455	416	347	328	347	233	203	172	84
Laurens.....	3,167	301	266	247	193	155	204	159	142
Lee.....	1,005	13	40	32	19	5	21	3	.....
London.....	5,691	1,252	1,357	1,313	1,079	829	604	333	163
Louisiana.....	10,063	324	404	376	301	219	157	132	14

TABLE II.—CONTINUED.

COUNTIES.	FREE COLORED.								
	1870.	1880.	1890.	1900.	1910.	1920.	1930.	1940.	1950.
Lunenburg.....	6,059	257	191	216	245	126	177	133	80
Madison.....	3,711	97	151	70	71	78	88	50	.....
Mathews.....	2,096	218	149	164	189	118	41	17	.....
Mecklenburg.....	14,156	898	912	1,055	889	674	493	553	416
Middlesex.....	2,522	126	149	142	116	135	127	84	51
Montgomery.....	2,882	147	66	87	56	31	57	39	6
Nansemond.....	5,517	2,480	2,144	1,407	1,698	1,398	1,269	910	490
Nelson.....	6,312	128	138	152	122	82	108	.....	.....
New Kent.....	2,361	364	432	373	342	334	308	218	148
Norfolk.....	22,320	2,803	2,307	2,290	1,899	1,491	1,179	559	251
Northampton.....	4,848	962	745	754	1,333	1,013	908	654	464
Northumberland.....	3,054	222	519	647	567	614	299	221	197
Nottoway.....	7,050	98	153	158	223	175	180	107	(c)
Orange.....	5,458	187	184	186	198	143	96	47	64
Page.....	986	384	311	216	.....	.....	.....	.....	.....
Patrick.....	2,325	131	98	103	117	100	275	130	.....
Pittsylvania.....	16,084	659	735	557	341	203	150	61	62
Powhatan.....	5,115	409	383	363	384	324	498	345	211
Prince Edward.....	7,898	466	488	570	475	334	149	63	32
Prince George.....	5,046	515	518	469	700	588	463	250	267
Princess Anne.....	3,902	195	259	202	343	251	267	85	64
Prince William.....	1,813	519	552	510	361	278	358	342	167
Pulaski.....	1,809	13	34	17	.....	.....	.....	.....	.....
Rappahannock.....	3,068	312	296	287	.....	.....	.....	.....	.....
Richmond.....	3,028	820	708	510	450	293	261	584	83
Roanoke.....	3,132	155	155	101	.....	.....	.....	.....	.....
Rockbridge.....	3,890	422	364	326	381	295	149	97	41
Rockingham.....	2,516	532	467	501	548	267	213	56	.....
Russell.....	1,167	51	71	26	33	21	36	13	5
Scott.....	524	52	34	48	16	13	.....	.....	.....
Shenandoah.....	676	816	292	265	458	317	147	85	19
Smyth.....	1,244	183	200	145	.....	.....	.....	.....	.....
Southampton.....	6,795	1,794	1,826	1,799	1,745	1,806	1,109	839	559
Spotsylvania.....	4,659	574	536	785	697	591	565	297	148
Stafford.....	1,485	319	313	369	485	361	316	193	87
Surry.....	3,192	1,284	985	1,070	866	612	664	500	368
Sussex.....	4,923	673	742	811	866	684	582	542	391
Tazewell.....	1,598	93	75	38	18	18	18	13	.....
Warren.....	1,105	284	366	342	.....	.....	.....	.....	.....
Warwick.....	1,052	59	42	21	27	34	18	21	33
Washington.....	2,653	249	112	212	261	153	127	386	8

TABLE II.—CONTINUED.

COUNTIES.	FREE COLORED.								
	1870.	1880.	1880.	1840.	1830.	1820.	1810.	1800.	1790.
Westmoreland.....	4,151	1,191	1,147	963	847	477	621	(c)	114
Wise.....	68	26							
Wythe.....	2,342	157	221	125	117	48	19	11	
York.....	4,691	682	454	650	627	631	453	45	353
	SLAVE.								
	1870.	1880.	1880.	1840.	1830.	1820.	1810.	1800.	1790.
Total	472,494	452,028	41,374 430,499	41,614 452,084	41,857 410,929	41,841 381,680	41,172 338,624	287,959	
Variances from former official totals..			b-100		b-5	b-2			
Accomac	4,507	4,987	4,680	4,654	4,480	4,542	4,429	4,262	
Albemarle.....	13,916	13,233	11,809	11,679	10,659	9,226	7,436	5,579	
Alexandria	1,386	1,382	1,374	1,614	1,857	1,841	1,172		
Alleghany.....	990	694	547	571					
Amelia	7,655	6,819	7,023	7,523	7,400	7,136	6,583	11,307	
Amherst.....	6,278	5,953	5,777	5,925	5,567	5,207	7,462	5,296	
Appomattox.....	4,600	4,799							
Augusta.....	5,616	5,053	4,135	4,265	3,512	2,880	1,946	1,567	
Bath.....	946	947	1,047	1,140	1,202	882	661		
Bedford.....	10,176	10,061	8,864	8,782	8,041	6,147	4,097	2,754	
Bland.....									
Botetourt.....	2,769	3,736	2,925	4,170	2,806	2,275	1,519	1,259	
Brunswick.....	9,146	8,456	8,805	9,758	10,081	9,368	9,422	6,776	
Buchanan.....	30								
Buckingham.....	8,811	8,161	11,014	10,929	9,939	11,675	6,336	4,168	
Campbell.....	11,580	10,866	10,045	9,496	7,445	5,368	3,671	2,488	
Caroline.....	10,672	10,661	10,314	10,741	10,999	10,764	10,581	10,292	
Carroll.....	262	154							
Charles City.....	2,947	2,764	2,433	2,957	2,967	3,023	3,013	3,141	
Charlotte.....	9,238	8,988	9,260	9,433	8,124	7,597	6,263	4,816	
Chesterfield.....	8,354	8,616	8,702	10,337	9,513	6,015	7,852	7,487	
Clarke.....	3,375	3,614	3,325						
Craig.....	420								
Culpeper.....	6,675	6,683	6,069	11,417	9,408	8,312	7,348	8,226	
Cumberland.....	6,705	6,329	6,781	7,309	6,813	6,102	5,711	4,434	
Dinwiddie.....	12,774	10,880	9,947	10,356	10,179	9,615	8,363	7,334	
Elizabeth City.....	2,417	2,148	1,708	2,218	1,643	1,734	1,522	1,876	
Essex.....	6,696	6,762	6,756	6,407	6,046	5,659	5,767	5,440	
Fairfax.....	3,116	3,250	3,453	4,001	4,673	5,942	6,078	4,574	
Fauquier.....	10,455	10,350	10,708	12,523	11,167	10,361	8,754	6,642	

TABLE II.—CONTINUED.

COUNTIES.	SLAVE.								
	1870.	1880.	1880.	1840.	1830.	1820.	1810.	1800.	1790.
Floyd.....		475	443	321					
Fluvanna.....		4,994	4,737	4,146	3,795	3,206	2,142	1,920	1,466
Franklin.....		6,351	5,726	5,158	4,988	3,647	2,672	1,574	1,073
Frederick.....		2,259	2,294	2,302	7,420	7,179	6,417	5,663	4,250
Giles.....		778	657	574	465	305	242		
Gloucester.....		5,736	5,557	5,691	5,691	5,208	5,798	4,909	7,063
Goochland.....		6,139	5,845	5,500	5,716	5,526	5,464	4,803	4,656
Grayson.....		547	499	492	462	345	270	170	
Greene.....		1,984	1,699	1,740					
Greensville.....		4,167	3,785	4,302	4,651	4,512	4,599	4,116	3,620
Halifax.....		14,897	14,452	14,216	14,528	9,880	9,663	7,911	5,565
Hanover.....		9,483	8,393	8,394	9,278	8,756	8,454	8,192	8,223
Henrico.....		20,041	16,109	13,237	12,251	9,804	8,594	6,901	5,819
Henry.....		5,018	3,340	2,852	2,868	2,178	1,755	1,415	1,551
Highland.....		402	364						
Isle of Wight.....		3,570	3,395	3,786	4,272	4,297	4,041	4,029	3,867
James City.....		2,586	1,868	1,947	1,983	2,460	2,320	2,389	2,405
King and Queen.....		6,139	5,764	5,937	6,514	6,041	6,003	5,380	5,143
King George.....		3,673	3,403	3,382	3,635	3,504	3,876	3,987	4,157
King William.....		5,525	5,731	5,780	6,310	6,010	5,788	5,744	5,151
Lancaster.....		2,869	2,640	2,478	2,632	2,944	3,112	3,126	3,236
Lee.....		824	787	580	612	366	336	243	
Loudoun.....		5,501	5,641	5,273	5,363	5,729	5,157	4,990	4,030
Louisa.....		10,194	9,864	9,010	9,382	7,560	6,490	5,992	4,573
Lunenburg.....		7,305	7,187	6,707	7,233	6,663	7,155	5,876	4,339
Madison.....		4,397	4,724	4,303	4,876	4,612	3,970	3,436	
Mathews.....		3,008	2,923	3,309	3,481	3,156	2,068	2,804	
Mecklenburg.....		12,420	12,462	11,915	12,117	11,402	10,264	8,676	6,763
Middlesex.....		2,375	2,342	2,209	2,138	2,166	2,476	2,516	2,553
Montgomery.....		2,219	1,471	1,493	2,026	1,255	1,099	963	823
Nansemond.....		5,431	4,715	4,530	4,943	4,526	4,462	4,408	3,817
Nelson.....		6,238	6,142	5,967	5,946	5,660	4,679		
New Kent.....		3,374	3,410	3,335	3,530	3,759	3,725	3,622	3,700
Norfolk.....		9,004	10,400	9,735	9,594	9,185	9,472	7,459	5,345
Northampton.....		3,872	3,648	3,620	3,734	3,323	3,350	3,178	3,244
Northumberland.....		3,439	3,755	3,243	3,357	3,268	3,847	3,903	4,460
Nottoway.....		6,463	6,050	7,071	6,942	6,676	6,363	5,983	(c)
Orange.....		6,111	5,921	5,364	7,983	7,518	6,516	5,242	4,421
Page.....		850	957	781					
Patrick.....		2,070	2,324	1,842	1,782	1,213	724	649	
Pittsylvania.....		14,340	12,793	11,558	10,999	8,484	6,312	4,133	2,979

TABLE II.—CONTINUED.

COUNTIES.	SLAVE.								
	1870.	1880.	1885.	1890.	1895.	1900.	1910.	1920.	1930.
Powhatan.....		5,408	5,282	5,129	5,472	5,476	5,091	5,031	4,325
Prince Edward.....		7,341	7,192	8,576	8,593	7,616	6,996	5,921	8,966
Prince George.....		4,997	4,408	4,014	4,598	4,323	4,486	4,380	4,519
Princess Anne.....		3,186	3,130	3,087	3,734	3,705	3,926	3,574	3,202
Prince William.....		2,356	2,498	2,767	3,842	4,380	5,220	5,416	4,704
Pulaski.....		1,589	1,471	954					
Rappahannock.....		3,520	3,844	3,663					
Richmond.....		2,466	2,277	2,363	2,630	2,664	3,178	2,826	3,984
Roanoke.....		2,643	2,510	1,553					
Rockbridge.....		3,985	4,197	3,510	3,398	2,612	1,724	1,070	682
Rockingham.....		2,387	2,331	1,899	2,321	1,871	1,491	1,052	772
Russell.....		1,099	982	700	679	526	886	352	190
Scott.....		490	473	344	330	258			
Shenandoah.....		753	911	1,033	2,423	1,901	1,038	791	512
Smyth.....		1,037	1,064	838					
Southampton.....		5,408	5,755	6,555	7,756	6,737	6,406	6,625	5,993
Spotsylvania.....		7,786	7,481	7,590	8,053	7,724	7,135	6,830	5,933
Stafford.....		3,314	3,311	3,596	4,164	4,368	4,195	4,343	4,036
Surry.....		2,515	2,479	2,853	3,378	3,340	3,440	3,258	3,097
Sussex.....		6,384	5,992	6,834	7,736	7,045	6,344	5,988	5,387
Tazewell.....		1,202	1,060	786	820	463	328	219	
Warren.....		1,575	1,748	1,434					
Warwick.....		1,019	905	831	919	954	1,120	1,024	990
Washington.....		2,547	2,131	2,058	2,568	1,898	1,448	900	450
Westmoreland.....		3,704	3,557	3,590	3,839	3,393	4,080	(c)	4,425
Wise.....		66							
Wythe.....		2,162	2,185	1,618	2,094	1,533	1,157	831	
York.....		1,925	2,181	2,112	2,598	2,165	2,931	2,020 740	2,760
CHINESE.									
Total.....	4								
Variances from former official totals..									
Alexandria.....	1								
Fairfax.....	1								
Princess Anne.....	2								

TABLE II.—CONTINUED.

COUNTIES.	INDIAN.								
	1870.	1860.	1850.	1840.	1830.	1820.	1810.	1800.	1790.
Total.....	229	94							
Variances from former official totals..									
Amherst.....	12								
Caroline.....	13								
Chesterfield.....	7								
Dinwiddie.....	21								
Giles.....	5								
Goochland.....	1								
Henrico.....		19							
King William.....	117								
Lee.....		10							
New Kent.....	15	1							
Norfolk.....	2	63							
Northumberland.....	1								
Rockbridge.....	6								
Southampton.....	22								
Washington,.....	7	1							

(*) All other persons, except Indians, not taxed.

(a) Then in the District of Columbia.

(b) These are variances from the totals of Virginia, including West Virginia. They result from errors too numerous to be here specified.

(c) Amelia and Nottoway tabulated together, and here placed opposite Amelia.

(d) In 1861 Bland from Giles, Tazewell, and Wythe.

(e) Richmond and Westmoreland tabulated together, opposite Richmond.

(f) Lacking to complete the official totals. Possibly the result of typographical errors. There are no manuscript returns with which to compare the printed census, which has totals of columns but no totals of any horizontal lines, therefore these deficiencies cannot be located in any civil division of the State.

INDEX.

ABBREVIATIONS.

App.—Appalachia grand division.	R'd or R'y—Railroad.
A. M. & O.—Atlantic, Miss. and Ohio R'd.	R. & D.—Richmond and Danville R'd.
A. & F.—Alexandria and Fredericksburg R'd.	R. F. & P.—Richmond, Fredericksburg and Potomac R'd.
A. & W.—Alexandria and Washington R'd.	R. & P.—Richmond and Petersburg R'd.
B. R.—Blue Ridge grand division.	R., Y. R. & C.—Richmond, York River and Chesapeake R'd.
B. & P.—Baltimore and Potomac R'd.	St.—Station of R'd.
B. & O.—Baltimore and Ohio R'd.	Tr.—Tidewater grand division.
C. & O.—Chesapeake and Ohio R'd.	U. S.—United States.
Div.—Grand Divisions of Virginia.	Val.—The Valley grand division.
J. R. & K.—James River and Kanawha Canal.	Va.—Virginia.
M.—Manassas Branch R'd.	Va. Mid.—Virginia Midland R'd.
Mid.—Middle or Midland grand division.	V.—Valley Railroad.
P.—Petersburg R'd.	W. & O.—Washington and Ohio R'd.
Pied.—Piedmont grand division.	
Rich.—Richmond.	

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ERRATA.

- Page 23—Ninth line from bottom, for *Miocence* read *Miocene*.
- Page 33—Sixth line from bottom, omit “Tertiary *limestones* are frequent and furnish a very good building material.”
- Page 37—In table of analyses, in No. 5, for 0.22 of titanie acid read 0.12.
- Page 40—Fourteenth line from bottom, for Page read Rockingham.
- Page 84—Eighth line from top, for Latukiah read Latakiah.
- Page 86—Third line from bottom, for Greenville read Greenville.
- Page 130—The lbs. after Confectionery put after Tallow in next line.
- Page 140—For Quantity of Castings, 1872, put 3,550 for 3,350.
- Page 165—Put 100,615 in last blank of No. 3.
- Page 193—Seventeenth line from bottom, for too read two, and put and after cures.
- Page 209—First line from top, for Statistics in, put Statistics of.
- Page 224—Twenty-first line from top, for Covington read Evington.
- Page 227—Eighteenth line from bottom, for Fall's read Falls.
- Page 230—For Alexandria and Potomae, read Alexandria and Fredericksburg.
- Page 230—Put 1,623.5 for miles of completed railroad. See Appendix A, giving information to January, 1876.
- Page 230—Last column of table, for 427 read 426.5, for 123 read 162.7, for 106 read 108, for 52 read 58.5, and for 207 read 205. *Official changes.*
- Page 232—The General Assembly chartered a railroad from Buchanan to Clifton Forge.
- Page 233—Ninth line from top, for Connelville read Connelsville.
- Page 237—Eighteenth line from bottom, for Urbana read Urbanna.
- Page 237—Second line from bottom, for Engineer's read Engineers.
- Page 238—Twentieth line from bottom, insert comma after trucking.
- Page 248—Erase 15th line from bottom, after owner. Law repealed 1876.
- Page 257—Change page to 258, to agree with index. Page transposed.
- Page 258—Change page to 257, to agree with index. Page transposed.
- Page 258—After Wadesville put West Virginia. Put distance from Staunton to Washington 180 miles.
- Page 257—Third line from bottom, for 58 read 55.
- Page 280—Put Making, below Bread, over Inspection.
- Page 301—After Slaves, under Northumberland, for 237 put 270.

